POISONS - - - Abraham

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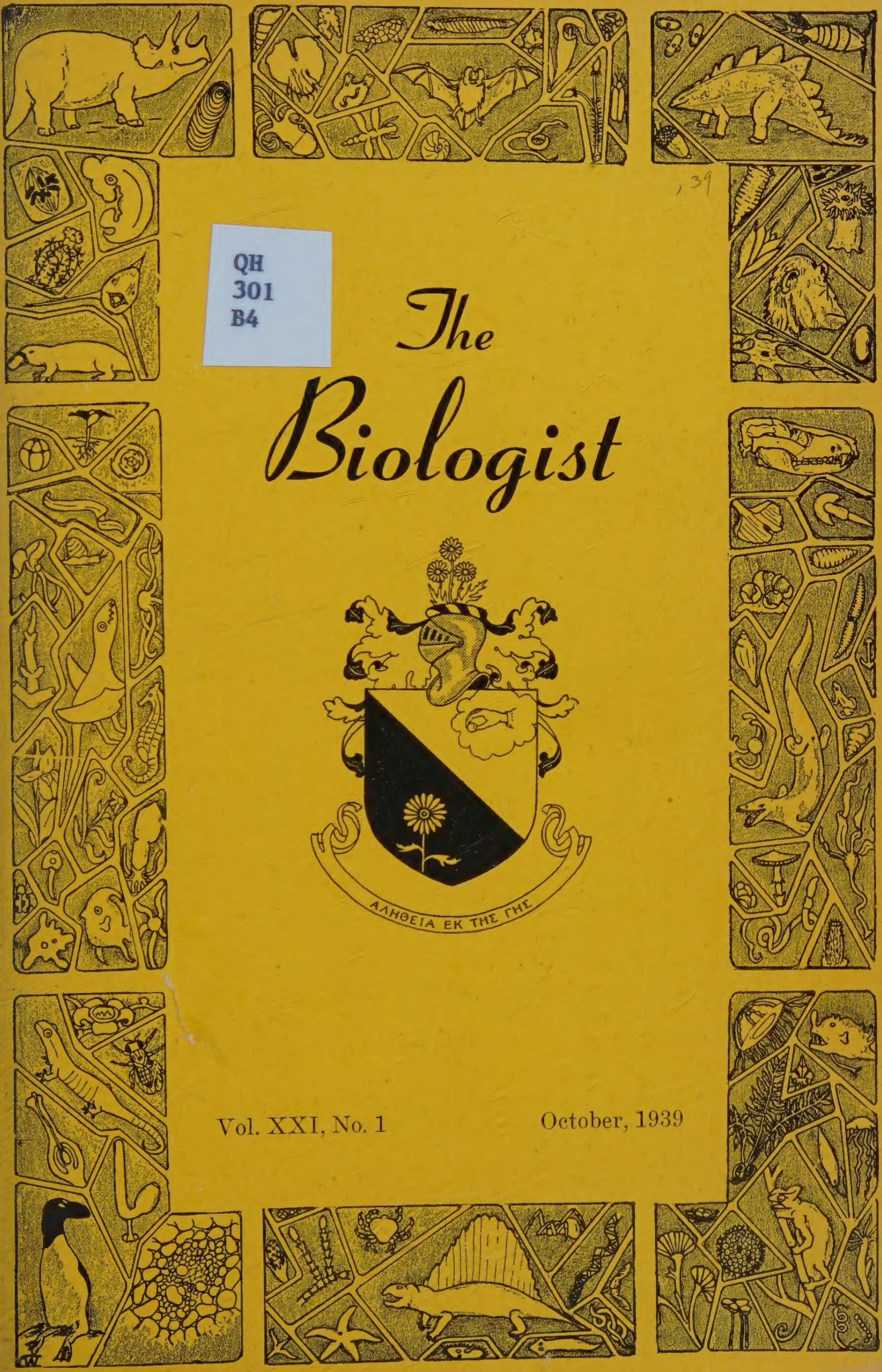
The Biologist



Vol. XXI, No. 1 October, 1939

COUNCIL MEETING REPORT

Phi Sigma
BIOLOGICAL HONOR SOCIETY

"The object of Phi Sigma is to promote interest in biological research. Although originally designated as an honorary biological research society, it should now be considered as a working guild of biologists interested in research. In effect, election to Phi Sigma should be an opportunity for better work, rather than merely election to an honorary society."

Mile Posts:

1915	March 17, Alpha Chapter organized, Ohio State University.
1916	May, Central Governing Body organized, BIOLOGIST first issued.
1917	June, last War-time BIOLOGIST issued.
1921	February, BIOLOGIST revived.
1924	December, First National Convention, Constitution revised, Washington, D. C.
1925	December, Second National Convention, First Scientific Program, Kansas City.
1926	December, Third National Convention, Second Science Program, Philadelphia.
1927	December, Third Science Program, Nashville.
1928	December, Fourth National Convention, Coat-of-Arms adopted, Fourth Science Program, New York.
1930	January, Council Meeting, Ritual Revised, Norman, Okla. December, Fifth National Convention, Fifth Science Program, Cleveland.
1931	Phi Sigma Letters Registered, U. S. Patent Office.
1932	December, Sixth Science Program, Atlantic City.
1933	June, Sixth National Convention, Seventh Science Program, Chicago.
1935	December, Seventh National Convention, Eighth Science Program, St. Louis.
1937	December, Eighth National Convention, Ninth Science Program, Indianapolis.

Expansion:

The Constitution provides that: "An active chapter may be established in any institution of learning which requires for graduation the equivalent of four years of collegiate work, and which is equipped with facilities for research work. - - - - Any petitioning group must be active for at least one year before it may be granted a charter."

THE BIOLOGIST

Vol. XXI Denver, Colo., October, 1939 No. 1

Published by the Phi Sigma Society, an organization devoted to the promotion of interest in biological research, founded at Ohio State University, March 17, 1915. The Biologist is the official quarterly publication of the society, issued ordinarily in October, December, February and April, as a medium of exchange between chapters, as an interpreter of Council policies, and as a stimulus to the fellowship in science for which Phi Sigma stands.

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Dr. Alexander G. Ruthven (Beta '30)
President of the University of
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Ann Arbor, Michigan

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Botany Department,
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Dr. Melville H. Hatch (Beta '18)
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OF ALL ACTIVE AND INACTIVE CHAPTERS

The list of chapter officers will be found in the CHAPTER NEWS section

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ALPHA

Ohio State University, Columbus, Ohio, founded March 17, 1915, (Inactive).

BETA

University of Michigan, Ann Arbor, Michigan. founded June 3, 1916.

DELTA

University of Maine, Orono, Maine, founded January 27, 1917.

EPSILON

University of Denver, Denver, Colorado, founded March 5, 1917.

ZETA

University of Wisconsin, Madison, Wisconsin, founded May 30, 1917.

ETA

University of Akron, Akron, Ohio, founded April 20, 1921.

THETA

Michigan State College, East Lansing, Michigan, founded April 9, 1921.

IOTA

Washington University, St. Louis, Missouri. founded May 28, 1921.

KAPPA

University of Kansas, Lawrence. Kansas. founded May 31, 1921.

LAMBDA

University of Montana, Missoula. Montana. founded May 4, 1921.

MU

University of California, Berkeley, California. founded April 27, 1922.

NU

Washington and Jefferson College, Washington, Pennsylvania, founded May 11, 1922.

XI

University of Nebraska, Lincoln, Nebraska, founded May 3, 1934.

OMICRON

University of North Dakota, Grand Forks, North Dakota,
founded May 26, 1924, (Inactive).

PI

Emory University, Georgia, founded January 3, 1925.

RHO

University of Illinois, Urbana, Illinois, founded March 28, 1925.

SIGMA

University of Florida, Gainesville, Florida, founded December 4, 1925.

TAU

Duke University, Durham, North Carolina, founded March 4, 1926.

UPSILON

Miami University, Oxford, Ohio, founded May 7, 1926.

PHI

University of New Hampshire, Durham, New Hampshire, founded May 21, 1926.

CHI

Montana State College, Bozeman, Montana, founded February 11, 1927.

PSI

University of Washington, Seattle, Washington, founded April 7, 1928.

OMEGA

University of Oklahoma, Norman, Oklahoma, founded March 24, 1928.

ALPHA ALPHA

University of Southern California, Los Angeles, California, founded May 17, 1930.

ALPHA BETA

Mount Union College, Alliance, Ohio, founded May 17, 1928.

ALPHA GAMMA

University of South Dakota, Vermillion, South Dakota, founded May 15, 1928, (Inactive).

ALPHA DELTA

Lawrence College, Appleton, Wisconsin, founded March 7, 1929.

ALPHA EPSILON

University of Pittsburgh, Pittsburgh, Pennsylvania, founded March 23, 1929.

ALPHA ZETA

College of William and Mary, Williamsburg, Virginia, founded April 19, 1930.

ALPHA ETA

Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma, founded March 13, 1930.

ALPHA THETA

State College of Washington, Pullman, Washington, founded May, 1930.

ALPHA IOTA

Bucknell University, Lewisburg, Pennsylvania, founded January 9, 1932.

ALPHA KAPPA

Hunter College, New York City, founded January 8, 1932.

ALPHA LAMBDA

University of Utah, Salt Lake City, Utah, founded February 13, 1932.

ALPHA MU

University and State College of Oregon, Eugene-Portland-Corvallis, Oregon, founded November 18, 1933.

ALPHA NU

University of New Mexico, Albuquerque, New Mexico, founded April 21, 1935.

ALPHA XI

Rhode Island State College, Kingston, Rhode Island, founded May 17, 1935.

ALPHA OMICRON

Marquette University, Milwaukee, Wisconsin, founded June 18, 1938

Poison in the Animal Kingdom

By Dr. Ambrosius Abraham

Professor of Biology, Szeged, Hungary

In general such substances are called "poison" which according to their chemical and physical qualities, upon getting into the human or animal organism, are harmful to it. They disturb its usual course of life and even in certain circumstances may cause its death. Poison may be found at every step, in the world of minerals, concealed in the roots and the leaves of many plants. Even the animal kingdom is not void thereof. For, excepting birds, we do not know a single class of animals whose groups or individuals are not provided with this destructive and protective weapon, so important for the maintenance of life individual and that of the race. There are animal-poisons that are ineffective to man and to superior animals, but there are also such that are the surest means of death to man. At any rate their effect depends on many circumstances, but more or less the destructive work of these poisons is due to the common cooperation of different factors. If the viper bites several people one after another, after each successive bite less and less poison gets into the wound, thus the last bites are never so dangerous as the first ones. We know of Cobras that are ten times as poisonous after casting than before, and experiments made with them have proved that the strength of poison may be increased by hunger. But the strength of snake poison also depends on the seasons. Knowing this fact, Landowzy refers to the belief of the natives of South America, that the bite of a certain snake is harmless, if certain constellations are visible in the sky.

Hibernating animals are not sensitive to poison. People suffering from leprosy have more resistance to snake bite. The mature Pangolin *(Tatus novemcinctus)* is insensitive to the poison of the Brazilian Scorpion although the new born Pangolin dies of the effect of this poison. The destructive power of the same snake-poison varies according to different animals. A certain quantity of Cobra-poison that kills 24 dogs each at the weight of 25 kilogramme, would kill 25 oxen, 60 horses, 600 hares, 800 rats, 2000 Guinea pigs, and 300,000 pigeons. A single Cantharide *(Litta vesicatoria)* is sufficient to poison a man if it gets into the intestinal digestive tract whereas the Caracurte Spider and the Scorpion consume it as a dainty bit.

All poisonous animals are divided into two groups. To the first group belong the active poisonous animals. These have a special poison producing organ, the so-called poison gland, that from the circulating blood and lymph produces a liquid which stupefies, paralyzes, and, under certain circumstances, has a fatal effect on other kinds of animals. To the second group belong those animals that have no poison-producing organ, but notwithstanding are poisonous. Their poison is due to the chemical properties of their different organs and tissues. The former are poisonous if the secretion of their poison gland gets into the organism, the latter if they are eaten by man or animal, or if their serum or the extraction gets sprayed into the organs of man or animal. To the latter belong also the Endoparasites that poison by the decomposition product which is produced by metabolism and enters by a secondary way in the different organs of the host. In both groups there are numerous animals, that may be dangerous even to man. Among these are the Coelenterata living in fresh water, but especially those of the sea. Varying greatly in number and variety of forms, species and colours, the sea-anemones and jelly-fish with their nettle-poison are in many cases, also very dangerous to man.

I wish, however, to mention certain kinds of insects whose poison has already killed many persons and animals. Well known among these are the groups of the caterpillar of the Processionary Butterfly *(Thaumetopoea processionea L.)* which is a really destructive danger to oak forests. The hairs of the body of this caterpillar contain deadly poison. Brockenhausen wrote (1790) that the hairs of the caterpillar of the Processionary Butterfly of the pine-tree *(Thaumetopoea pityocampa)* made into powder were given as drink to man, who was to be put out of the way. After having taken the drink, the man immediately felt very severe pains, his lips, his gums, his lungs and his bowels became inflamed and he soon died in terrible convulsions.

Generally known to be poisonous are the bee groups and among them the ordinary bee. Its poison effects equally both vertebrate and invertebrate animals. If we induce a bee to sting an earth-worm the worm soon dies, after great excitement, in spasmodic motion and strong secretion of phlegm. The deadly doses of poison in the vertebrata are very different. The bee sting on the bare surface of the human skin causes only local difficulties and sometimes causes burning pains, but after the sting may appear different local or more remote suppurations, which are however usually the results of the secondary infections. Bee poisoning in greater degrees may cause acceleration of heart activity, flow of saliva, dispnoe, difficulty in sight and hearing. Naturally these are passing symptoms, but cases are known of man and horses that have become victims of stings by beeswarms. The explanation is that in these cases a very great quantity of poison gets into the organism. Very dangerous are the bee stings that reach the tongue, the pharynx and the palate. Those injuring the pharynx may cause a great oedema that closes the entrance of the larynx, and if there is not immediate surgical intervention, may cause suffocation. More difficult to understand are such cases when we hear that somebody had died ten minutes after a bee had gotten into his ear, or a wasp had stung his hand. In such cases we must believe, that sting found its way into a blood vessel and thus the poison was immediately circulated. The stinging of 500 bees causes death to an adult.

An especially poisonous animal is the spider called the Caracurte *(Lathrodectes tredecimguttatus)*, living in the south of France, in Corsica, in Spain, in Italy and in Russia. Without any trouble it eats the exceedingly poisonous Cantharides. Its bite is very dangerous both to man and animal. According to Motschulsky, on the banks of the under Volga river a great increase of Caracurte once caused the death of 70,000 cattle. In 1898 according to Rossikow's statements in the region of Sir-Darja in the district of Kasalynsky, 1035 domestic animals were bitten by the Caracurte and among these 340 fell victims of the poison. Rossikow even mentions that in the Kasalynsky district 349 men were poisoned by Caracurte and of these 11 died.

Among the flies the most dangerous is the Kolumbacsi fly *(Simulium columbacensis)*. This fly being 3 to 4 millimeter long, having blackish-yellow feelers, appears epidemically in summer, gets on to the surfaces of the bodies of its victims, chiefly cattle and swine, invading the noses, ears and mouth. In 1888 in a little town in west Europe in the space of 4 hours, 400 swine, 80 horses and 40 cattle died of the sting of this little fly. In 1923 in 4 provinces of Roumania as the consequence of the sting of Kolumbacsi flies 16,474 cattle and 2,834 swine died. Death may ensue in severe cases in 2 to 4 hours after the bite, in other cases the poison will kill the victim only on the 7th or 8th day. The Kolumbacsi fly is dangerous enough to man and on the bare surface of the skin may cause burning pains.

Snake-poison is more dangerous and better known from the standpoint of human experience. Its chemical composition is not yet exactly known. According to Lamb and Martin, all we know about it is that it is a composition of different toxic ferments—fibrin ferments, antifibrin ferments, proteolytic ferments, different cytolysins, agglutinins and some kind of antibactericidal substances, one or more neurotoxins, and frequently a substance called haemorhagin. The neurotoxin is that part of the poison that effects the nervous system and paralyzes its function. The haemorhagin causes bleeding of a greater degree in different organs, chiefly in the kidneys. The venom of snakes is dangerously poisonous both to man and to animal. Its effect generally depends on two factors, on the quantity of the poison and on the place of the bite, but the biological effect differs according to the kinds of poisonous snakes, one having rather a strong local effect, the other directly paralyzing the function of the central organs. While the poisonous snakes are therefore very dangerous to man and to a great many animals, their poison has not an universal effect. The porcupine notices the smell of the viper lying in the soil, searches for it, digs it out and with the greatest delight consumes it with its poison and poison glands. The martens, the foxes and the swine eat snakes. On the banks of Mississippi trained pigs used to hunt for poisonous snakes. The Ichneumon *(Herpestes ichneumon)* and the Mungo *(Herpestes griseus)* eat venomous snakes without any harmful consequences. Snake-eating among the birds is the short-toed eagle *(Circaetus gallicus)*, but the most dangerous snake-killer is the immensely glutonous Secretary bird *(Serpentarius secretarius)*. Levailland found in the stomach of such bird 21 small tortoises, 11 lizards, 3 snakes, many locusts and insects. We also know snakes that feed on other snakes. Snakes are eaten by the Naja bungarus and sometimes by the Sand-viper *(Vipera ammodytes)*. However the greatest destroyer among them is the Brazilian Mussurana, a non-poisonous snake, that actually wrings the neck of its victims. In the snake garden of San Paulo a single Mussurana killed and devoured 81 poisonous and 4 non-poisonous snakes in three and a half years.

The poison of snakes as is generally known, is very dangerous to man and therefore it is very important to know what has to be done if somebody is bitten suddenly by a snake. The first thing is to prevent the spreading of the snake-poison after entering the wound. Secondly we have to endeavor to extract the poison from the body, or to neutralize, or to decompose it. Thirdly, the biological disorder caused by the poison ought to be stopped by drugs, the so-called symptomatics that accelerate the function of the heart. We may try to prevent the absorption of the poison by tying the bitten extremity. In this case the bandage ought to be placed between the base of the limb and the wound. As a bandage a handkerchief, a towel, a rubber tube or something similar may be used. The bandage has to be tight so that the circulation of blood shall be slackened in the bitten place, but the bandage may be not kept longer on the body than half an hour, else symptoms of decomposition may appear on the limb. After bandaging the bitten limb the wound has to be enlarged so that a greater quantity of blood may run out. For this purpose we may suck out the wound, however in this case the saliva must not be swallowed. The sucking of the wound is not dangerous, if the teeth and the mucous membranes of the mouth are quite sound. In Africa, where there are many dangerous poisonous snakes, Europeans, who are sensitive to snakebite are accompanied by native servants and if the snake has bitten anyone, the latter suck out the wound. It is advisable to cauterize the wound with a redhot iron and to apply strong acids as a local remedy. It is much more advisable to spray one per cent of solution of potassium permanganate around the wound, that stops the fatal effect of poison not yet absorbed. It is very good to employ a 2 per cent water solution of calcium chloride because potassium salts go into chemical composition with the neurotoxin of the snake poison. Good result may be obtained by spraying 1 per cent of gold chloride or Eau de Javelle (1:10 water solution on the wound). Among useful symptomatics are alcohol and camphor, but the only sure remedy is serum produced in the blood of horses.

Poisons are produced in the glands situated in the skin of Salamanders and Frogs. These poisons however may only cause unpleasantness to man, but not cause death. The only exception is the little Brazilian frog *(Dendrobates tinctorius)* whose dry poison even in a very little dose may cause death to man. The Indians catch these little 3 to 3.5 cm.-long frogs alive, they roast them. A milk-like yellowish liquid flows out of the skin of these animals, which is used for poisoning their arros-tips. The exudate of a single frog is sufficient to poison 50 arrow-tips.

The poison of the toad is very often mentioned and may in greater doses cause death to little mammals. According to statements of some research workers, the poison of the toad and of the Bombinator dissolves the red corpuscules. According to Krakow the poison of the gray and green toad has an anesthetic effect to such a degree that it is possible to cut out a piece of the limb of the frog which has been previously treated with toad-poison, without any reaction. On the other hand, the poison of toad is a heart-poison, belonging to the digitalis group and has the same effect on the heart and on the blood circulating organs. This was known to people in ancient times, because it was prescribed by popular healers as an anaesthetic and as a diuretic. The poison of toad is used in China since very ancient times under the name of "Senso" as a cardiac stimulant. The natives of Argentina use the poison of toad even to-day against tooth-ache and not without reason, because the therapeutic use of toad-poison has a pharmacological effect. Thus toad-poison has the same effect on the heart as digitalis, causes anesthesia in tissues as does cocaine, and causes the bloodvessels to shrink as does adrenalin.

The blood of epispastic beetles, especially that of the larva of cockchafer *(Meloe proscarabeus)*, and the Spanish Fly *(Lytta vescicatoria)* contains a very dangerous poison. This poison is Cantharidin. It is a very stimulative substance, that causes hyreraemia and blisters full of exudation on the healthy skin. Therefore it is used as an epispastic. Cantharidin is easily absorbed by such a skin and passing through the blood causes inflammation of the kidneys. It may also cause an inflammation on the walls of the urine-passage. It is an extremely dangerous poison. One gramme of it is sufficient to kill 20,000 men. The Spanish Fly containing Cantharidin was used in the middle ages as a magic-poison. In some countries it is used even now among the peasants for criminal purposes. The Spanish Fly is not only a venereal stimulant, but also one of the strongest and most dangerous poisons, which even in small quantities may start heavy haemorrhages.

Lampreys *(Petromyzon)* and some species of sharks are only poisonous when used as food. The roe of the barbel *(Barbus barbus)* and that of the bream *(Abramis brama)* is only temporarily poisonous. They are however generally not fatal. A fatal poisoning may follow after consuming of the roe of a certain Ostracions *(trunk fishes)* living in tropical and subtropical seas. In Japan many people have died from it.

Many illnesses may be caused by the parasites of different tapeworms *(Cestoda)*, flukes *(Trematoda)*, and round-worms *(Nematoda)*. The poisons produced by them produce many symptoms of diseases and sometimes many serious debilities. The edible Clam and Oyster may become poisonous under certain circumstances but this only happens if the animals themselves are ill. On such occasion the toxins produced in them poison the consumer.

I have tried to summarize the most important data and advice referring to animal poison. It is, in my opinion, of the greatest importance from a pathological, biological, pharmaceutical and medical standpoint, that they should not be kept from the interested public, because the administration of first aid and the saving of life often depends upon the intelligence and vigilance of one's fellow men.

What produced these poisons, when and why the complicated apparatus were formed, why only certain animals were provided with these terrible destructive and defensive weapons—these are questions to which a philosopher might perhaps give a pleasing explanation. It is quite impossible to give an exact answer to these as well as to many thousands and thousands of other questions that like links of a chain arise before us when we try to get a glance into the immensely great and wonderful territory of Nature. I too have thought about these questions and when I did not find any explanation either from without or within my mind, my reflection was always interrupted by a microscopical picture which I saw not long ago. I saw under a lens of the microscope a few drops of water with one bigger and some smaller glittering, one-celled animals. The bigger one moved very quickly in the water, colliding with one of the smaller animals, devoured it at once. Later a second, a third and a fourth struggling animal disappeared quickly into the interior of the voracious robber. The poisoner kills the aggressor in order to save its own life and to have food, but the poisonous animal itself does not escape from the attacks of others. We don't know any poisonous animal whose venom would have deadly effect on all other animals. The Caracurte consumes the dangerous Cantharide, the Caracurte is made harmless by the sting of wasps, the wasps and bees are consumed by frogs and toads, whereas they themselves are the prey of snakes. Snakes are destroyed by porcupines, by pigs, by other snakes and by birds. Birds eat ants with delight, even Spanish Flies, but with few exceptions they are quite unprotected against the poison of snakes. Socrates died of the juice of the hemlock and some plant lice avail themselves of it as a refreshment. Nature is full of enigmas, full of mysteries, we see, we admire them, or we shudder at their sight, but we are unable to understand them.

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National Council Meeting

Report as Sent to Chapter Offices

The following is a condensed report of the meeting of the National Council Phi Sigma which was held in Denver, Colorado, September first and second, 1939.

1. The council requests the approval of the National Meeting (convention) in its unanimous selection of Dr. L. J. Cole for the honorary office of National President of Phi Sigma.
2. The council discussed at length details of arrangements for the forthcoming National Meeting to be held in Columbus, Ohio, December 29-30.
3. Discussion of the preliminary reports made at this time of the National Secretary and National Treasurer.
4. The following motion was passed: All new business to be brought before the National Meeting including nominations for National Officers must be introduced at the meeting previous to the last business session.
5. The council asks that any of its actions which require ratification be considered at the first business session of the National Meeting.
6. The council recommends that in the interest of economy no attempt be made to swell the endowment fund as proposed by Alpha Zeta chapter at the last convention.
7. The council recommends amendments to section 1-a of the By-laws to read as follows: "The regular national initiation fee for active members shall be five dollars ($5.00) plus such an additional amount as each local chapter shall determine for itself. Of the five dollars paid to the national treasury, three dollars shall be allotted to the meeting fund and general fund, and two dollars shall be credited to the Biologist fund" and that part of the final sentence of section 1-a which follows the semi-colon be deleted.
8. After considerable discussion concerned with the endowment fund policy the council makes the following recommendations: That any funds accumulating be held for future contingencies and that the term "endowment fund" be dropped and the term "contingent fund" be substituted.
9. After the council discussed the subject at some length it was moved and passed "That the presidents of Iota, Mu, Alpha Iota, Alpha Alpha, Epsilon, Pi, and Alpha Nu be appointed a committee effective immediately to foster and investigate new chapters as recommended by the last convention. The chairman of this committee is to be the president of Mu chapter." The chairman of this committee is to report to the forthcoming National Meeting through his chapter delegate.
10. After a very considerable discussion it was moved and passed by the council that, for the purpose of investigating and reestablishing

the inactive chapters of the organization, the officers of the following chapters are hereby appointed: Alpha Epsilon to report on Alpha, Phi to report on Delta, Beta to report on Theta, Kappa to report on Xi, Zeta to report on Omicron, Rho to report on Alpha Gamma, Alpha Omicron to report on Alpha Delta. The officers of the chapters in charge of these efforts are to report to the National Meeting; through their delegates.

11. After a lengthy discussion it was moved and passed by the council —"That in as much as the future of our organization depends in part at least on alumni encouragement and participation in our activities and in as much as many of our student members will later become alumni or faculty members, the National Council appoints the presidents of the following chapters Psi, Sigma, Omega, Tau, Lambda, Upsilon, and Alpha Xi as a committee to study the problem and to present a tentative policy as their recommendations on the floor of the National Meeting. The chairman of this committee is to be the president of Tau. The chairman of this committee given above is to report to the National Meeting through his chapter's delegate.
12. After listening to a detailed report from the editor of the Biologist the National Council decided to appoint the officers of Alpha Kappa as a committee to investigate the possibility of securing additional advertising for the Biologist, and to report at the next National Meeting through the chapter delegate.
13. Further, following additional discussion, the council recommends that hereafter galley-proof of all articles for the Biologist be sent to the authors for correction with the understanding that the article will be printed as set up if proof is not returned promptly; and further that Phi Sigma will furnish to the author gratis one hundred reprints of his article, any additional number *at cost* if ordered through the National Editor *at the time* the manuscript is submitted.
14. After a consideration of the membership problem in our organization it was moved and passed by the National Council that the presidents of the following chapters Eta, Nu, Chi, Alpha Beta, Alpha Eta, Alpha Theta, Alpha Lambda and Alpha Mu be appointed as a committee to survey the problem of increasing active membership of the individual chapters and to bring in their recommendations as a report to the forthcoming National Meeting. The chairman of this committee is to be the president of Alpha Mu. The chairman of this committee given above is to report to the National Meeting through his chapter's delegate.
15. The tentative agenda for the National Meeting will be as follows:
    1. The delegates from the following chapters are appointed members of a local reception and credentials committee to function with the National Treasurer immediately before the calling to order of the first session: Eta, Upsilon, Alpha Beta, Beta, Alpha Kappa, and Nu.
    2. Call to order.
    3. Report of credentials committee.

   4. Announcements.
   5. Introduction of delegates, National Council, past National Officers.
   6. Report of previous council meetings.
   7. Appointing of committees.
   8. Nominations for National Officers from the floor.
   9. Introduction of new business for consideration at later sessions.
   10. Recess for committee meetings.
   11. Reports of special committees.
   12. Report of National Meeting committees.
   13. Election of officers.

16. The National Council ordered the National Secretary to remind each chapter as soon as possible after the opening of the school year of the forthcoming National Meeting and customary scientific program, to the end that delegates who are not reading papers before other national societies may be prepared to do so at the Phi Sigma Scientific Session and further, that papers by members who are not present at the meeting will be read *by title only* in accordance with the action taken by the last National Meeting.
17. As the result of serious problems which have arisen in many chapters, the National Council proposes the following constitutional amendment affecting article IV, section 2, and recommends its serious consideration at the coming National Meeting. "The following words to be inserted in the first sentence of section 2 after "Who has shown special ability for research work" *or a general grade average of B or Higher.*"

A. I. Ortenburger,
National Secretary.

* * *

Food For Thought

A Message To Every Phi Sigma

By Dr. A. I. Ortenburger

In July, 1940, my term of office as National Secretary of Phi Sigma expires. My successor will be elected at the forthcoming National Meeting during the Christmas holidays of 1939. It occurs to me that the best thing I can do for Phi Sigma at this time is to give you members some idea of the necessary qualifications for this office and some of the duties it entails. The position of National Secretary is a real working job and not any sort of honorary position to be given to "a big name" who would not be willing or able to give the time and thought to Phi Sigma that the job requires—and I use the word *job* advisedly.

First of all I wish to emphasize the fact that in enumerating the following list of activities and duties I am in no way complaining or "kicking"; I have been glad to do what I can to be of service to Phi Sigma. I am merely listing the things which this office must do so that the chapters may better understand the functions of the central office of our fraternity.

Of all the national officers the chapters deal most with the National Secretary. I know that the other members of the National Council agree with me when I say that of all the council offices those of the National Secretary and Treasurer are the most important from the standpoint of relationships with the real units of our national organization, the chapters. Even in a normal year when a directory is not being published or when there is no National Meeting there is a multiplicity of detail for the National Secretary to look after. In all probability the greatest amount of time is required for dictation of letters.

For the last several years, we have found that something over one hundred dictated letters are written each month of the school year; well over one thousand for an average year. Most of these letters are sent to the officers of the chapters, to the council members, to the artist who letters the certificates, and to the printer who issues the BIOLOGIST and printed supplies. Not included in this number are mimeographed letters which would increase the total by many hundred. Routine duties may be outlined as follows:

1. The filling of orders sent in from the chapters for membership record blanks, constitutions, cards, medals, and so on.
2. The ordering of certificates of membership, which consists of at least four distinct steps:
    a. Checking cards against record blanks for spelling, type of membership and so on.
    b. Sending the dictated letter to the artist requesting the lettering of certificates.
    c. Filing of the membership

Legend National Secretary's Office, Zoology Building, University of Oklahoma, Norman, Okla. (Courtesy of the University of Oklahoma)

record blanks and cards. Your National Office now has four large very full steel filing cabinets containing the nearly 10,000 membership record blanks arranged chronologically by chapters as well as the nearly 10,000 cards arranged alphabetically. In addition there are the letter files and a small room holds the old records and supply of old numbers of the Biologist. (Thanks are due the University of Oklahoma and the Zoology Department for the use of space in the fine new fireproof building.)

   d. Sending a post card to the Chapter Secretary informing him that these certificates have been ordered.

3. Keeping accurate check of the new officers and address changes from each chapter.
4. Corresponding with groups and institutions interested in establishing new chapters.
5. The making of mimeograph stencils for the annual chapter letter. This is actually a letter of instruction for the new chapter officers. It is vitally necessary to obtain the names and addresses of all of the new chapter officers as promptly as possible. This may sound very simple but please believe me it is not. In many cases six or

eight letters must be sent to one institution before anyone can be reached who is even a member at that institution and in the meantime the new officers are probably wondering why they don't hear from the national office.

6. Ordering the model keys to be used during initiation, obtaining these keys when made and sending them to the chapters.
7. Ordering coats-of-arms colored and sending them.
8. Making a record of rituals issued, and checking the receipt for the same.

In addition to these clerical matters, the National Secretary has several other problems to attend to now and then. Two which require considerable time concern the installation of a new chapter and the approval of honorary members. I will explain the first as an example. When a society at an institution writes about obtaining a charter of Phi Sigma, it is of course necessary not only to answer the letter but if it seems at all probable that a charter might be granted, to send a detailed letter of instruction on the preparation of a petition. After the petition reaches this office, letters and copies of the petition must be sent to the other members of the National Council asking for their votes. After the approval of the Council is received, the petitioning group must be so informed. When the petitioners inform us when they will be able to send copies of the petition to all chapters, they must be furnished with an up-to-date list of the chapter secretaries. All chapter secretaries are then sent a letter telling them that they will receive petitions of which the National Council has approved. Each chapter secretary must also be sent a petition receipt form and a petition ballot form. When these ballots are returned to this office they must be carefully checked and filed. If the petition is passed upon favorably, the National Chancellor is so informed, so that he may issue a proclamation granting the charter. The National Secretary's office must send the petitioning group the necessary membership record blanks, etc. to be filled out. When these are received, certificates for the charter members must be ordered lettered. Several letters will then usually be necessary to determine a proper date for the installation. More correspondence then ensues to arrange for a proper installing officer. A letter must then be sent to each chapter informing secretaries of the date of the installation. All this machinery must operate every time Phi Sigma installs a new chapter.

During the first half of every second year (when we hold our National Meeting) there is a great amount of extra work to be done and most of it must be done very promptly. Preparation for our national convention begins about seven or eight months before the actual time of our meeting when arrangements must be made with the American Association for the Advancement of Science with which Phi Sigma is affiliated. The arrangements include the selection of the time of our meeting, the meeting place with details as to numbers to be present and equipment that will be needed such as projectors, blackboards, etc., and finally reservation of space at the proper time for our usual banquet. Menus must be chosen at proper prices and rooms reserved. All this must be done during May and June. In the fall preparations for our meeting begin in earnest following sending the customary annual chapter letter. An announcement of the forthcoming meeting must be sent to each chapter giving the necessary information as to time, place, the necessity of electing their chapter delegate promptly and so on. Then later, we must send details such as lists of hotels and rates, credential blanks for delegates, our own tentative program, agenda for our meeting, how the National Treasurer will send railroad fare to delegate, the matter of other expenses, and so on. Additional letters must go to the American Association giving them our program; proof of this program must then be read. Further details of the banquet arrangements are then taken care of including the selection of a proper speaker.

Are you wondering why I have been so explicit about some of the National Secretary's duties? Solely to acquaint you active members with the importance of a wise selection of your next National Secretary. His work must be done with promptness, judgment, and tact. He must always remember that it is not the fault of the chapter officers when something does not go as it should, for as we know they are new each school year.

Bear in mind all these things when electing your National Secretary.

* * *

Editorials

To Resume Where We Left Off

Quiet campuses which drowsed through the late summer days have wakened to activity again. Bells and clocks signal the beginning and end of class periods as hundreds of thousands of young Americans begin or continue to advance themselves along the road to educated citizenship. Within classrooms and laboratories the low-voiced preceptor measures out his words as he strives to broaden youthful horizons, pushing back the oft too narrow bounds of ignorance. In the library there is a reverent calm as the student with the ears of the mind hears the voice of some great master as he reads. Out on gridirons and athletic fields, the crack of boot against leather, the thud of crashing bodies, the shrilling of a drum-major's whistle, the chant of a collegiate war-hymn, all signalize the resumption of extrascholastic activity at its noisiest and showiest.

All of this is part of that apprenticeship for life that men call "going to college." It is that little space of time when youth can think the long, long thoughts and dream those dreams which often prove the inspiration of a lifetime. "But", you say, "there's precious few students who look at it that way." There is every possibility that you are right. But, if our form of society, the democracy, is going to continue to exist, we all need the help, the inspiration, the guidance of the Thinker. Finding him is a long protracted process of winnowing out the chaff, and, on this side of the Atlantic, the way we do it is the way of higher education. It is, of course, an expensive process. It is a time-consuming process. It is, by all standards, a wasteful process. Even then, who shall say that the less important members of society are not thereby improved? If out of a thousand noisy, thoughtless, extroverted, superficial students, there are turned out ten who dream, who feel, who think, our democracy is in a fair way to maintain itself. College will turn the dream to a vision, will discipline the emotions, will activate the thinking of such a student to the enrichment of his own life, and the good of contemporaneous society.

Looking Into The Future

No one can claim to have really seen the U. S. A. until he has visited Williamsburg, Virginia, that little resurrected colonial city, which lies between the York and the James rivers. There is something about it which "gets you." To the college student a particular interest attaches to the quaint buildings of William and Mary College, no matter what scholastic ancestry he may claim. To the member of an honorary fraternity, however, most impressive of all is that reconstructed dining room in which, by the light of flickering candles, more than a hundred years ago, the progenitor of all our honor fraternities, Phi Beta Kappa, came into being.

Today, as Phi Sigma rounds the curve towards its first quarter century, it is hard not to philosophize about Phi Beta Kappa. Organized in an age when scholarship really meant something, Phi Beta Kappa grew from a single chapter in a little tidewater college until it spread throughout the country. Achieving fame as it went, it stands today in a unique position, with chapters in some of the greatest universities and some of the smallest colleges on the continent. Despite its far-flung membership it has achieved a remarkable uniformity of purpose and unity of ideals that is worthy of admiring emulation. More than this, it has weathered the storm of a disastrous war between the states which sundered even religious denominations, and rose triumphant out of a welter of conflicting ideologies to be the leading scholastic honor group in the educational world.

When we of Phi Sigma become discouraged because the present hopes which we envision for OUR society seem so slow in coming true, we should look to our elder sister society in the honors group, and take heart.

Going Home

The National Council has announced the Ninth National Meeting of Phi Sigma to be held in Columbus, Ohio, during the meetings of the American Association for the Advancement of Science this coming holiday season. In many respects this will be more than an ordinary meeting. In addition to all the routine affairs there will be the problem of electing a new Vice-Chancellor and a Secretary, there will be the formal observance of the twenty-fifth anniversay of our existence as a national organization. In many another way this year's National Meeting will be significant. For it was in Columbus, Ohio, at Ohio State University, that Alpha Chapter of Phi Sigma was organized on March 17th, 1915. The coincidence of the National Meeting in Columbus so close to the date of our actual foundation makes this the most fitting occasion for a formal commemoration. Past national officers and all the honorary members of the Society are being invited to attend the banquet. It is not improbable that a fairly large number will be at the A. A. A. S. meetings, because Columbus is quite centrally located, so in all probability we shall have an excellent opportunity to meet many of our leading members.

The December BIOLOGIST

In keeping with a precedent established two years ago before the Indianapolis National Meeting the next issue of the BIOLOGIST will be devoted almost exclusively to Chapter News Letters. By the time this issue comes from the press every chapter president and secretary will have been requested to send in to the editor not only their chapter news, but also any proposals for action at the National Meeting, and the names of their candidates for nomination to the positions of National Vice-Chancellor and Secretary. If all this material is in the Editor's hands in time its publication will give every member an opportunity to form an intelligent and deliberate opinion on the problems confronting the Society, its National Officers, the local chapters and their officers.

For this reason we have not asked for Chapter Letters for the October issue. Instead of devoting the December number to any one institution as we have done so often in the past two years on the recommendation of the last National Meeting, we shall make the forthcoming issue an All Phi Sigma number, with messages from the National Officers, the revised list of Past National Officers and Honorary Members, and the above requested Chapter recommendations, nominations and campus news. If every Chapter Officer puts a shoulder to the wheel the December issue will be a pretty clear cross-section of Phi Sigma as it is today. And that in itself will be a good souvenir of our approaching Silver Jubilee.

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Chapter News Letters

Beta

—University of Michigan

President—Karl Goellner, Museum of Zoology, Univ. of Mich., Ann Arbor, Mich.
Vice-President—J. W. Gebhard, Dept. Psychology, Univ. of Mich., Ann Arbor, Mich.
Secretary—Florence Muyskens, Dept. General Linguistics, Univ. of Mich., Ann Arbor, Mich.
Treasurer—Stephen S. White, Dept. Botany, Univ. of Mich., Ann Arbor, Mich.

Epsilon

—University of Denver

President — William Cormack, 2479 Sheridan Blvd., Lakewood, Denver, Colorado.
Vice-President—Office to be filled this fall.
Secretary—Esther Jane Wood, 2220 So. St. Paul, Denver, Colorado.
Treasurer—Eleanor Knight, 376 So. Curtis, Littleton, Colorado.

During Spring Quarter Epsilon Chapter held four meetings.

Among these was one open meeting, two regular meetings, and initiation. David Howard and Stanley Koziara were pledged in April. Each presented interesting research papers, namely, "The Antiquity of Man in America" by David Howard, and "The Weed Menace" by Stanley Koziara. Formal initiation was held for these pledges on May 24 at the home of our Sponsor, Mrs. Becker.

It gave the chapter great pleasure last spring to present Mrs. Becker with a Phi Sigma key as a small token of the many kind things she has done for us. Also, Helen Dowling received the Phi Sigma Award for outstanding work in the field of geology last spring.

This fall we are looking forward to several open meetings, and to the pledging of new members.

Esther Jane Wood

Zeta

—University of Wisconsin

President—David G. Frey, 355 Biology Bldg., Univ. of Wisc., Madison, Wisc.
Vice-President—Marcus I. Wegner, 117 Biochemistry Bldg., Univ. of Wisc., Madison, Wisc.
Secretary—M. A. Sprague, 67 Agronomy Bldg., Univ. of Wisc., Madison, Wisc.
Treasurer—Irvin Fuhr, 108 Agric. Hall, Univ. of Wisc., Madison, Wisc.
Editor—Robert H. Burris, 13 Agric. Hall, Univ. of Wisc., Madison, Wisc.

At its Spring initiation Zeta inducted the following members: William Thomas Atkinson, Kermit Carl Berger, William Charles Brodhagen, Thayer Warren Burnham, Albert Irving Coombes, Carl G. Heller, Peter Glaister Hogg, Paul Hermann Hornburg, Robert S. Hutton, Herbert Paul Jacobi, Charles Milton Kirkpatrick, Charles Flemings Krewson, Paul Reed Ozanne, Harold Davis Roberts, Alan W. Roecker, Henry Schwerma, Ewald Erdman Selkurt, Robert Thomas Stevenson, Earl L. Stone, Eldon D. Warner, Dennis Wallace Watson, Charles Herman Winkler, Jr.

Zeta has chosen no recipient for the Phi Sigma medal for the last two years. The setup here is of such a nature that the selection of a candidate either within or outside the membership could scarcely be made with any fairness. The group represented is so diverse that no adequate criterion for selection could be established.

Robert H. Burris, *Secretary.*

Eta

—University of Akron

President—Bill J. Barkley, Biology Dept.
Vice-President, Treasurer—Robert C. Hare, Biology Dept.
Secretary—Aubrey P. Allman, Biology Dept.

Kappa

—University of Kansas

President—Edgar Beahm, 609 Snow Hall, Univ. of Kansas, Lawrence, Kansas.
Vice-President — Clarence Brumback, 116 W. 17th, Univ. of Kansas, Lawrence, Kansas.
Secretary—Gerald Pees, 22 F. S., Univ. of Kansas, Lawrence, Kansas.
Treasurer—James Sprague, 216 Snow Hall, Univ. of Kansas, Lawrence, Kansas.

Lambda

—University of Montana

President—Martha Jenkins, 330 University Ave., Missoula, Mont.
Vice-President—Oliver Roholt, Theta Chi House, Missoula, Mont.
Treasurer—James Whilt, Corbin Hall, Missoula, Mont.
Secretary — George Weisel, Cowell Apts., Missoula, Mont.

On May 20, Lambda initiated: William Henry Peterson, Jean Katherine Loughran, Jack G. Trump, Alice Marie Colvin, Stanley Howard Lewis, Nancy McGarity, Glenn Herman Mueller, Sylvester James Seidensticker, Robert Wayne Spicher, Walter Arthur Helm.

Mu

—University of California

President—Robert Ray, 1107 Colusa Ave., Berkeley, Calif.
Vice-President—Werner Braun, 1820 Delaware St., Berkeley, Calif.
Secretary—Louise Lorenz, 3036 Hillegass Ave., Berkeley, Calif.
Treasurer — Angelo Capobiance, 65 Culebra Terrace, San Francisco, Calif.

Nu

—Washington and Jefferson College

President — Walter H. Kasserman, Lambda Chi Alpha House, Washington, Pa.
Vice-President — Ned Doscher, Hayes Hall, Washington, Pa.
Secretary—Donald R. Rose, Lambda Chi Alpha House, Washington, Pa.
Treasurer—Herbert G. Grether, 34 S. Lincoln St., Washington, Pa.

Rho

—University of Illinois

President—Margaret Kaeiser, Botany Dept., University of Ill., Urbana, Ill.
Vice-President—Victor Sprague, Zoology Dept., University of Ill., Urbana, Ill.
Secretary—Jane Claire Dirks, 203 Expt. Zoology Laboratory, Champaign, Ill.
Treasurer—Thomas Lord, Bacteriology Dept., Univ. of Ill., Urbana, Ill.

The following were accepted into membership on May 24: Joseph Ortan Alberts, Mary Josephine Cox, Harry Warren Cummings, Jr., June Rose Geller, Edward N. Gilman, Thelma Lee Grumbles, C. Clayton Hoff, Marian Frances James, Rissell Arthur Kaberg, Kenneth Lee Knight, Ralph Delavan Lowell, Russell Robert McKean, Geraldine Marguerite Moon, William Edwin Morris, Marion Iola Nielsen, Karl Robert Pomrenke, Charles Joseph Rickher, Don Melvin Snyder, Gustavus Berry Stuart, Fred Wilbur Tanner, Jr., Charles Marshall Wilson, Bertrand Albert Wright.

Sigma

—University of Florida

President — Lewis Marchand, University Station, Gainesville, Fla.
Vice-President — Kenneth Swinford, School Forestry, University of Fla., Gainesville, Fla.
Secretary — Wilber DeVall, School Forestry, University of Fla., Gainesville, Fla.
Treasurer—Coleman Goin, Dept. of Biology, University of Fla., Gainesville, Fla.

The local Sigma Chapter had an unusual treat this past spring in holding its initiation at Welaka, Florida, on the University of Florida Conservation Reserve. The Reserve consists of some two thousand acres of forest land bordering on the St. Johns River. This land is supervised by the University of Florida through the Biology Department and the School of Forestry. It affords an excellent opportunity for biological studies on quail, deer and aquatic birds, mammals and insects. The forested lands are managed by the School of Forestry and also present unlimited fields for research in ecology and timber management.

Certain studies have been started by members of Sigma Chapter on the Reserve and will be continued this year and in future years. Sigma Chapter feels proud to have such opportunities for research open to it in the fields of Biology and Forestry.

W. B. DEVALL, *Secretary*.

Tau
—Duke University

President—Nelle Causey Bevel, Zoology Dept., Duke University, Durham, N. C.

Vice-President—Helen Ramsey, Zoology Dept., Duke University, Durham, N. C.

Secretary—Mary Humphreys, Botany Dept., Duke University, Durham, N. C.

Treasurer—Mary Wolf, Zoology Dept., Duke University, Durham, N. C.

Upsilon
—Miami University

President—Russel E. Hay, Phi Kappa Tau House, Oxford, Ohio.

Vice-President — David Siehl, 242 Ogden Hall, Oxford, Ohio.

Recording Secretary—Eunice Schauer, 29 Bishop Hall, Oxford, Ohio.

Treasurer—Ole Davis, 218 N. Campus Ave., Oxford, Ohio.

Cor. Secretary—Ernest Sons, 112 N. Campus Ave., Oxford, Ohio.

Phi
—University of New Hampshire

President—Dr. Stuart Dunn, Eldredges Main St., Durham, N. H.

Vice-President — Philip Conture, 56 Mill Road, Durham, N. H.

Secretary—Eleanor Sheehan, 39 Main St., Durham, N. H.

Treasurer—Joseph Stone, Student Co-op., Durham, N. H.

Chi
—Montana State College

President—Albert Mihelic, Entomology Dept., Montana State College, Bozeman, Mont.

Vice-President—Marvin Kelley, Botany and Bacty. Dept., Montana State College, Bozeman, Mont.

Secretary—Daisy Flick, Botany and Bacty. Dept., Montana State College, Bozeman, Mont.

Psi
—University of Washington

President—John A. Ellegood, College of Pharmacy, U. of Wash., Seattle, Wash.

Vice-President — V. Roland Rethke, Dept. of Botany, U. of Wash., Seattle, Wash.

Secretary—Ruth E. Coats, 123 Johnson Hall, U. of Wash., Seattle, Wash.

Treasurer—John Bryce Glud, 4238 12th N. E., U. of Wash., Seattle, Wash.

On May 25th the following were accepted into the chapter: Rosalie Breuer, Harold Eugene Broadbooks, Rhomas Alfred Dawson, David Vance McCallister, Orville H. Miller, Herbert Parkes Riley, Jose V. Yap-chiongco.

Omega
—University of Oklahoma

President — Elaine Walker, Zoology Dept., Univ. Okla., Norman, Okla.

Vice-President — Robert E. Kuntz, Zoology Dept., Univ. Okla., Norman, Okla.

Secretary — Martha Flowers, Botany Dept., Univ. Okla., Norman, Okla.

Treasurer—Paul Smith, Botany Dept., Univ. Okla., Norman, Okla.

Miss Walker presided during the initiation of the spring pledges, April 25, 1939. An informal coffee hour followed the ceremony. New members of the Omega Chapter are: Wendell Allen and Dorothy Thornton of the Botany Department; Vonna Lee Lamme and Robert Kuntz of the Zoology Department; Lilyan Clayton and Betty Klinglesmith, students of Applied Biology. The new members were guests of the chapter at the annual spring meeting of the Oklahoma Academy of Science, April 28 and 29, in the Cookson Hills near Muskogee, Oklahoma. We enjoyed the botany, zoology, and geology field trips, and the evening programs in which lectures on biology and geology of the surrounding country were presented.

On May 10, Dr. Bienfang of the School of Pharmacy of the University of Oklahoma gave a lecture, "Odors of Drug Plants." On May 12, a steak-fry was given in a lodge near Norman.

MARTHA FLOWERS,
Secretary of Omega Chapter.

Alpha Alpha
—University of Southern California

President—Robert Knowles, 924 W. 34th St., Los Angeles, Calif.
Vice-President—Charles Lockhart, 3987 Menlo Ave., Los Angels, Calif.
Secretary—Valoris Layne, 2022 Marengo Ave., South Pasadena, Calif.
Treasurer—Rodrique Gravelle, 11240 Kling St., North Hollywood, Calif.

The following were initiated May 12: Jerome William Briskin, Chung Fu Cheng, James Ensign Crouch, Malcolm Gibson Dickinson, Thomas Osborn Dorr, Peter Warren Eberle, Lois Field Hallman, Jean Brooks Merrill.

Alpha Beta
—Mount Union College

President—Gene Austin, R. R. No. 2, Alliance, Ohio.
Vice-President—Dorothy Ayers, 2365 S. Arch, Alliance, Ohio.
Secretary—Mary Stephens, 536 W. State St., Alliance, Ohio.
Treasurer—Evelyn Warther, 536 W. State St., Alliance, Ohio.

Alpha Beta conducted two initiations last year. At the first on November 10th those accepted were: James Waite Weldy, James Joseph Sells, Dorothy Ellen Ayers, Sara Elizabeth Doody, Mary Louise, Oliver.

On the 23rd of February the following: John Marion Thomas, Mary Amelia Stephens, Richard Harry Kelty, Evelyn Jane Warther, Eugene J. Weber, Donald Frederick Bauman, John Ruben Bottomy, Dorothy Belle Arter, Elizabeth Jane Gallaher.

Alpha Epsilon
—University of Pittsburgh

President—Philip Walker, Biology Dept., University of Pittsburgh, Pittsburgh, Penn.
Vice-President—William Charlesworth, Biology Dept., University of Pittsburgh, Pittsburgh, Penn.
Secretary—Dr. Edna Higbee, Biology Dept., University of Pittsburgh, Pittsburgh, Penn.
Treasurer—Olga Catizone, Biology Dept., University of Pittsburgh, Pittsburgh, Penn.
Rec. Secretary—Helen Worthing, Biology Dept., University of Pittsburgh, Pittsburgh, Penn.

Alpha Eta
—Oklahoma A. & M. College

President—Harold Winters, Hanner Hall, Okla. A. & M., Stillwater, Okla.
Vice-President—Not elected yet.
Secretary—Not elected yet.
Treasurer—Steven Butler, Hanner Hall, Okla. A. & M., Stillwater, Okla.

Alpha Theta
—State College of Washington

President—Sidney C. Beinke, 605 Campus, Pullman, Wash.
Vice-President—Philip J. Pfan, 310 Campus, Pullman, Wash.
Secretary—LaVerne Brugger, 1505 Maple, Pullman, Wash.
Treasurer—Elwood B. Frye, 507 Main, Pullman, Wash.

Alpha Iota

—Bucknell University

President — Richard Snyder, Sigma Chi House, Lewisburg, Pa.
Vice-President—Cornelius Roughgarden, N. 6 St., Lewisburg, Pa.
Secretary — Naomi Heritage, Ziegler Infirmary, Lewisburg, Pa.
Treasurer—Barbara Ludwig, Women's College, Lewisburg, Pa.

Initiation and installation of officers took place at the annual formal banquet, held on May 29th in the Orange and Blue Room of the Hotel Lewisburger. The ceremonies were conducted by the retiring president, Robert Griesemer. The new officers are listed above, while the new initiates are Richard Snyder, Barbara Ludwig, Ruth Perry, Catherine Ashman, Helen Greenleaf, Janet Clayton, Wm. Kershner, and Wm. H. Eyster, Jr.

During the summer our second annual report was published, which contains, in addition to financial report, roster, and representative photographs, brief resumes of all the research papers presented during the school year.

Opening of the University in September finds most of the newly graduated members still following in scientific lines: Robert Griesemer at Harvard Medical School, Bruce Kephart and Wm. Eyster at University of Pennsylvania Medical School, Wm. Kershner, (ex-'41) at dental school, Ruth Perry and Jane Snyder engaged in medical technology at Geisinger Memorial Hospital, Danville, and Jefferson Hospital, Philadelphia, respectively, and Joseph Merrion as teacher of Biology and Chemistry at Keystone Junior College, Scranton.

Plans are being made to hold the first fall meeting early in October, at which time the new students eligible for membership will be invited to hear about the requirements of the society.

Yours truly,
NAOMI HERITAGE

Alpha Kappa

—Hunter College

President — Mildred Maisler, 1665 Townsend Ave., Bronx, New York City.
Vice-President — Sophie Berck, 1521 Fulton Ave., Bronx, New York City.
Secretary—Mildred Spector, 1871 Harrison Ave., Bronx, New York City.
Treasurer—Edith Meyer, 531 E. 78th St., New York City.

On June 16, 1939 Alpha Kappa Chapter held its Spring semester initiation dinner at the Hotel Wellington in New York City. Dr. Libby Hyman of the American Museum of Natural History served as a guest speaker and informed us of her recent work with Invertebrate Forms.

The following new members were initiated: Miss Ruth Bierenbaum, Miss Mildred Broad, Miss Celia Dubnik, Miss Sylvia Dubnick, Miss Rose Feier, Miss Frances M. Gerson, Miss Helen J. Kalinsky, Miss Alice E. Lehmuth, Miss Llewella Pritchard, Miss Shirley R. Rabinowich, Miss Shirley Rubin, Miss Helen Schilsky, Miss Ethel Schneck, Miss Gertrude Schwartz, Miss Vivian Sweibel, Miss Lillian White, Miss Judith Widoff.

MILDRED SPECTOR,
Chapter Secretary.

Alpha Mu

—University and State College of Oregon

President—Donald Marcy, Dept. Zoology, Oregon State College.
First Vice-President—Dr. Ethel Sanborn, Dept. Botany, Oregon State College.
Second Vice-President—John Pierson, University of Oregon Medical School.
Secretary—Helen Lockren, Dept. Education, Oregon State College.
Treasurer—Maxwell Doty, Dept. Botany, Oregon State College.

At a ceremony held May 24, 1939, the following new members were initiated: Bertram R. Bertramson, Alvin J. Braun, Clara Ann Budlong, E. Clair Calavan, Dr. R. W. Dougherty, Dr. F. Archibald Gilfillan, George Y. Harry, Irving B. Hazeltine, Donald E. Marcy, William A. McCluskey, William B. Morse, Bryan C. Ryan, George W. Stephenson, Earl H. Tryon, L. Lisle Walker, Walter M. Whitwell.

The new officers were elected and installed.

The Phi Sigma medal was presented. This year's recipient was Clair Calavan, senior in science, who had completed 89 credits of science, and had an all school grade point average of 3.88.

The speaker at the initiation banquet was Dr. F. A. Gilfillan, who spoke on old books of his collection. He showed several old science books that were printed by early printing presses.

HELEN LOCKREN

Alpha Nu

—University of New Mexico

President—Ports Bretney, 505 S. Walter, Albuquerque, N. Mex.

Vice-President—Oscar Syme, 905 W. Goal, Albuquerque, N. Mex.

Secretary—Miriam Roberta Higbee, 229 N. Walter, Albuquerque, N. Mex.

Treasurer—Louise Lipp, 2122 E. Silver, Albuquerque, N. Mex.

Alpha Xi

—Rhode Island State College

President—Louis Stringer, East Hall R. I. S. C., Kingston, R. I.

Vice-President — Natalie Whiteford, Delta Zeta House, R. I. S. C., Kingston, R. I.

Secretary—Virginia Hornby, R. I. S. C,. Kingston, R. I.

Treasurer—Henry Weiss, East Hall, R. I. S. C., Kingston, R. I.

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Book Reviews

The thumbnail sketches of current biological literature appearing in this section are not meant to be exhaustive or deeply critical. They aim to survey the rapidly growing field of biology. Naturally these reviews represent the candid opinions of various readers not necessarily those of members of the National Council, nor even those of the Editor.

THE APINAYE, CURT NUMUENDAJU, *Catholic University of America Press, Washington, D. C., 1939. $2.50*

Most productive of all the divisions at the Catholic University, the anthropological department's publications begin to assume a commanding position in the research that is coming from Catholic institutions. This important contribution from the pen of a native Brazilian who has been doing field work for the Institute of Social Sciences at the University of California will easily commend itself to all who are interested in the ethnology of comparatively uncivilized South American peoples. The Apinaye inhabit the triangle formed by the confluence of the Rio Tocantins and the lower Araguaya. Up to now very little has been reliably known about them. This work discusses their social structure, initiation ceremonies, family life, salutations, sports and games, warfare, laws, religion, and includes a number of their myths and tales.

A BIBLIOGRAPHY OF NATURE-STUDY, EVA L. GORDON, *Comstock Publishing Co., Ithaca, N. Y., 1939. $0.25.*

This is a reprint from Mrs. Comstock's well known handbook on Nature-Study. It contains a number of valuable lists of reference works which will be helpful to librarians and school teachers.

BIO-ECOLOGY, FREDERIC E. CLEMENTS AND VICTOR E. SHELFORD, *John Wiley & Sons, New York, 1939. $4.50.*

For too long botany and zoology have been drifting apart. Too many students of biological science have been let loose on an unsuspecting world knowing no more about the other half of biology than the proverbial one half of the world which knows nothing about how the other half lives. It was perhaps inevitable that Ecology, which suffered long enough from this compartmentalization, should be the branch of Biology which finally should draw the two dissident camps back together to form an understandable and articulate whole. Thus Drs. Clements and Shelford have braved a traditional bogie. Whether the magnitude of their work will receive the credit that is its due remains to be seen. Undoubtedly there will be many suggestions for change and improvement in the present volume. Be it so,—this is a noble and long overdue effort. Given time and a sympathetic reception, it should develop into one of the outstanding contributions to the study of biological science.

BIOLOGY, CHARLES F. SEVERIN, *The Bruce Publishing Co., Milwaukee, 1939.*

The lithoprinted preliminary drafts for this textbook have been previously commented upon in this magazine. It now appears in an attractively printed form, well and profusely illustrated. As a textbook for high schools where religion is still a vital factor, it will fill a long-felt need. That it will do so with credit both to religion and to biological science goes without saying. The author has an enviable record in one of our greatest endowed universities, his friends are men of outstanding position in the scientific world. They have encouraged him to carry on his project in the publication of this work. That he will be commended for his objective attitude should be inevitable. The book will be an "eye-opener" to many who wonder just how a reputable scientist can still be a leader in religious education.

A BIOLOGY OF FAMILIAR THINGS, G. L. BUSH, ALLAN DICKIE AND RONALD C. RUNKLE, *American Book Co., Chicago, 1939. $1.92.*

The first impression one gets of this book, aside from its comfortable bulk, is its attractive get-up, its easy readability and its fresh illustrations. Further inspection reveals that as a high school text this one is really different. Gone are many, if not most, of the traditional laboratory-specimen-dominated chapters. In their stead are lively discussions based on the living forms that young people contact daily. For a course where laboratory equipment is unavailable, or at a very low minimum, this would appear to be an ideal text.

BIOLOGY OF THE VERTEBRATES, HERBERT E. WALTER, *Macmillan Co., New York, 1939. $4.00.*

This is a newly revised version of a standard comparative anatomy which first appeared in 1927, and immediately won so many friends that eleven reprintings were made. This edition, with nearly a hundred additional pages, and about as many new illustrations, should carry on the tradition of a distinctly superior textbook. The material is refreshingly written, the drawings are clear, and plentiful, the general format leaves nothing to be desired. As a textbook for comparative vertebrate anatomy it has few equals,—as a reference work for college freshmen, or for high school biology students, it will be invaluable.

CHEMICAL GARDENING FOR THE AMATEUR, CHARLES H. CONNORS AND VICTOR A. TIEDJENS, *Wm. H. Wise & Co., New York, 1939.*

The product of the joint labors of Rutgers University and New Jersey Agricultural Experiment Station experts, this new work on plant chemiculture should fill a definite place in our need for authoritative and reliable information on this interesting development. The book is amply supplied with diagrammatic sketches illustrating the various techniques employed, and there are a number of color photographs of results obtained. It is a very desirable volume.

THE CHISEL-TOOTH TRIBE, WILFRED S. BRONSON, *Harcourt Brace & Co., New York, 1939. $2.00.*

This is an attractive book about the rodents, with many illustrations by the author in black and white, and in color. While it will make a very desirable gift book for the holiday season, it must not be thought that it is merely a volume for children. Even a middle-aged person will enjoy it, and as far as this reviewer can ascertain, it is scientific enough as far as its factual material is concerned. That the names of the forms described are given only in the popular form is, perhaps, to be regretted.

CHORDATE ANATOMY, H. V. NEAL AND H. W. RAND, *P. Blakiston's Sons, Philadelphia, 1939. $3.50.*

Written by members of the Tufts College and Harvard University zoological teaching staffs, this new work has much to commend it. Three years ago its authors collaborated on a more pretentious work in comparative anatomy. The present book is an adaptation of that particular work to a one-semester course in the anatomy of the chordates. The book therefore emphasizes both its own practical and theoretical purposes, to serve as a text for students of advanced zoology, and to organize more firmly the anatomical evidences thus far available for organic, and particularly, human evolution. The volume is well illustrated by clearly diagrammatic sketches. There is no bibliography, but a very full glossary should be of material aid to the student.

DATING PREHISTORIC RUINS BY TREE-RINGS, W. S. STALLINGS, *Laboratory of Anthropology, Santa Fe, New Mexico, 1939. $0.50.*

The budding science of dendrochronology is here introduced in a popular fashion in a slim 20-page paper which makes most interesting reading. It is little appreciated that almost the year of a pueblo's construction can be determined by tracing the rings in the wooden beams used in its construction. Most of the trees is a given area which belong to closely related genera will evidence the same annual-ring reaction to the same climatic factors. Thus far, three age-areas have been charted,—one for the region near the junction of the four states, Arizona, Utah, Colorado and

New Mexico, which goes back to A.D. 11,—another for the eastern New Mexico-Rio Grande region, going back to 930 A.D. The final area is the one already well-known, that of the California sequoias, dating back to 1305 B.C.

DOCTOR, HERE'S YOUR HAT, Joseph A. Jerger, *Prentice-Hall, Inc., New York, 1939. $2.75.*

Here's a BOOK! One that every premedical student, every young doctor, should be required to read time and again. Perhaps it would be just as well to stipulate their reading it just once. The ones who are medically worth while will want to read it again, the others, who have no business going into medicine, wouldn't do so anyway. This is the life story of one of those invaluable, but increasingly rarer, geniuses, a general practitioner. No more telling plea for general medicine, as opposed to narrow specialization, has ever been, or could be, written. The specialists are saying to the old-time "family doctors" what the title of the book indicates. And it ought to be checked, somehow.

EARTH'S GREEN MANTLE, Sydney Mangham, *Macmillan Co., New York, 1939. $3.50.*

It would not be surprising if "Earth's Green Mantle" blazed another new trail in the already voluminous literature that is growing up around the subject of science-popularization. Sydney Mangham is probably no stranger to British readers. To us, here in America, he is more or less of a newcomer, but one whose writings are going to give him a standing welcome. His present book is a popularization of botany. It is unusually full of new, as well as forgotten old, ideas which need recapture and retelling. Aside from its popular angle, one is inclined to believe that a careful reading, equally careful digestion of his subject-matter, and its judicious use by a number of botanical professors would go far to liven many lecture periods which now are devoted to didactic presentation and bored reception. That the author is no stranger to much of our American botanical literature and development is evidenced by the number of references both to our botanical research and the use of photographs from the States.

ELEMENTS OF PLANT PATHOLOGY, I. E. Melhus and G. C. Kent, *Macmillan Co., New York, 1939. $4.00.*

Instead of the all too common comparative morphological aspect of fungal infection, this book boldly stresses the parasitic aspect of disease causing organisms. It confines itself to the principles and the practices of plant pathology, leaving to advanced research the history and cyto-anatomical aspects of these types of infections. Such being the case, it should be a most practical textbook for beginners in the courses in this field.

EXPERIMENTS IN PLANT PHYSIOLOGY, W. E. Loomis and Charles A. Shull, *McGraw-Hill Book Co., New York, 1939. $2.00.*

This is an entirely new book which will be a distinctly superior aide to students in plant physiology, horticulture, forestry, and agronomy,—as well as a very handy reference for those who are teaching freshman biology or botany. Anyone who has taught freshman courses in biological science knows how clammily stereotyped much of our laboratory work has gotten to be. For beginners in plant science this new laboratory manual leaves very little to be desired. It should receive a well-deserved welcome.

FIELD BOOK OF ANIMALS IN WINTER, Ann H. Morgan, *G. P. Putnam's Sons, New York, 1939. $3.50.*

Dr. Morgan is the professor of zoology at Mount Holyoke College. She is also a well-known naturalist. This is not by any means her first book. Nor, it is to be hoped, will it be her last. In this handy pocket volume she takes her readers afield in the least prepossessing season of the year and reveals what a tremendous amount of life is still going on in the least expected places. It is indeed fortunate that Biology is getting out-of-doors. There has been grave danger that it degenerate into a mere round of laboratory routines. The rise of modern Ecology has upset all that.

Biology is to be congratulated that there still are outdoor-observers left to carry on the tradition of Darwin, White, Thoreau and Agassiz.

A FIELD GUIDE TO THE BIRDS. Roger T. Peterson, *Houghton Mifflin Co., Boston, 1939. $2.75.*

This is a revised and enlarged version of one of the most practical bird guides published in recent years. It is based not on the detailed measurements and comparative features of large numbers of birds, but on a few, outstanding, and most easily distinguished characteristics frequently manifested in the field. The first edition was popular. This new edition should easily eclipse its predecessor, and afford endless pleasure to those students of the out-of-doors who do not happen to be museum specialists.

FLORAL MORPHOLOGY, E. R. Saunders, *W. Heffer & Sons, Ltd., Cambridge, England, 1939. 10s.6d. net.*

The present six hundred-odd-paged volume is the second in a series devoted to the newer outlook on floral morphology which the author bases on his interpretation of the Gynaeceum. 151 additional families of flowering plants are treated here, bringing the total for the two volumes up to 190. The book is more profusely illustrated than its predecessor, and there is an index covering both volumes. Plant taxonomists and specialists in morphology will be interested in these works.

FUNDAMENTALS OF ZOOLOGY, Wm. J. Tinkle, *Zondervan Pub. House, Grand Rapids, Mich., 1939. $3.00.*

Every now and then a college professor throws up his hands in despair at the current publishers' offerings in his own field and sets himself down to write his own textbook. No one denies that this is the way most college manuals are written, but it is usually the leaders in the field whose books are sought after by the rank and file of the teaching profession. When, however, the professor in the small college, who has definite ideas and convictions of his own essays to produce a text which shall embody what he wants to teach, the rest of the educational world sits back aghast at his temerity. This, we fear, is what is going to happen to Dr. Tinkle's book,—and it does not deserve such treatment. It is remarkably well done, and deserves a favorable reception. There are any number of schools where conscientious scruples against wholesale acceptance of the Huxley-Spencer type of evolutionary hypotesis still exist. If there is any validity in our theory of intellectual liberty, this book deserves its day in court.

THE GENETICS OF GARDEN PLANTS, M. B. Crane and W. J. C. Lawrence, *Macmillan Co., New York, 1938. $3.25.*

Emanating from the John Innes Horticultural Institution, Merton, England, this revised and rewritten edition of a not so well-known manual for plant breeders deserves its fair share of recognition on this side of the Atlantic. Only three middle chapters are devoted to specific plant groups, flowering and ornamental plants, vegetable and salad plants, and fruits. The rest have to deal with the cytology and genetics of diploids and polyploids, the chemical basis of flower colors, bud-sports and other variations, incompatibility and sterility, and the origin of new forms. There is also a newly revised list of the chromosome numbers of the forms mentioned in the book. All in all, a very worthy addition to our shelves of genetic and horticultural literature.

GERMAN-ENGLISH SCIENCE DICTIONARY, Louis DeVries, *McGraw-Hill Book Co., New York, 1939. $3.00.*

The advance of modern science and invention makes most foreign language dictionaries obsolete in a few years time. It is well therefore that this new book reaches us fresh in its first edition from American university sources. Since, with the outbreak of a new European war there is little liklihood that the products of what is left of German scholarly study and scientific research will deluge our intellectual horizons for some time to come, this book should last for some time as the latest handbook on scientific German terminology. It contains some 48,000 terms pertaining to practically every field of biological science. It is clearly printed in handy size and is bound in leatheroid for constant and heavy usage.

HEALTH, HYGIENE AND HOOEY, W. W. BAUER, *Bobbs-Merrill Co., Indianapolis, 1938. $2.50.*

This is the latest of the debunking books started by "100,000,000 Guinea Pigs" a few years back. However, in this case the author is a reputable physician in a mid-western community and he speaks with authority,—as well as with warmth and vigor. Somewhere in the course of one of the chapters the author comments on the fact that it is a fatal thing to try to discourage the American people from following all they see and believing all they hear in health matters. It is absolutely true, and for the same reason this book will not be a best seller, and it won't be long before you will search in vain for it on library shelves. The time has not come for the latter part of Barnum's maxim to come true. All the more reason, therefore, for this book to get into as many hands as possible, particularly in the biological teaching profession,—in the whole teaching fellowship, for that matter.

HERBS, HELEN NOYES WEBSTER, *Hale Cushman & Flint, Boston, 1939. $1.00.*

It is a far cry from the bee gardens of Virgil, the monastery cloister gardens of the middle ages, and the "yarb" plots of our great-grandparents, to our present-day age of synthetic pharmaceuticals. Nevertheless, it's an even bet that this slim book is going to have a hearty welcome from a lot more than those whose interest in herbs is simply nostalgic. It is perhaps a significant fact that here in America where fresh meat, cereal, vegetables, and dairy products are so plentiful, we have developed a national taste for them almost in the raw, with little or no seasoning. Europe, on the other hand, has had to content itself with less fresh and tougher meats. As a result, the use of herbs to impart delicate shades of flavor long since came into use. Then too, there is the undeniable vitamin and mineral content of these plants which our forefathers learned to appreciate. We may not yet need potherbs to season our poor meats, but we should recapture a little of the epicurean thrill of the nuance of flavors which a studied and judicious use of herbs could give to our daily bread,—and meat and potatoes.

HUMAN PHYSIOLOGY, P. G. STILES, *W. B. Saunders Company, Philadelphia, 1939. $2.25.*

Seven separate editions of this popular manual were published during the life of its distinguished author. This eighth edition has been revised by his friend and collaborator, Dr. Gordon C. Ring. The book has not been materially altered in the process, and what changes have been made are entirely in line with the scope and plan of the original work as it was conceived by the late author.

INDIA RUBBER MAN, RALPH F. WOLF, *The Caxton Printers, Caldwell, Idaho, 1939. $3.00.*

This is the story of Charles Goodyear, the inventor of the vulcanization process for the hardening of rubber. It is written by a young man on the technical staff of the B. F. Goodrich Tire and Rubber Company, himself a rubber worker. So many and so preposterous are the stories which have risen about the life and deeds of Charles Goodyear, that it is high time someone with a personal interest in this field should have done something about it. That it has been effectively done no one who reads this absorbing tale will doubt. The Caxton Printers have, as usual, given the story a most satisfying and readable setting.

INTRODUCTION TO ANIMAL BIOLOGY, JOHN B. PARKER AND JOHN J. CLARK, *C. V. Mosby Co., St. Louis, 1939. $3.75.*

"Variis modis bene fit," is an old Latin proverb which has been popularly paraphrased in American idiom as "There's more than one way of skinning a cat." In other words, the perfect biological textbook is one which fills its purpose to perfection, no matter by whom or for whom it is written. Different courses need different texts. After a careful study of this text we feel that it would be about as perfect as any for a rigidly regimented course which concentrates on terminology and a thorough study of a few forms, which has little use for scientific research and the development of experimental curiosity, which uses little or no bibliographic references to collateral readings,—to sum it up,—in a meticulously thorough course preliminary to the traditional comparative anatomy, histology and embryology, which in some quarters are still felt essential as a preparation for medical study. The illustrations are to a large extent copied from other and older textbooks. The viewpoint is purely morphological, the physiology of life processes is on the whole unjustifiably slighted.

INTRODUCTION TO FLORAL MECHANISM, S. G. JONES, *The Chemical Publishing Co., New York, 1939. $4.00.*

The first impression given by the name of this textbook is that it has been devoted to elements in the floral structure. Closer inspection reveals that it is intended as a textbook for university first-year students, based, however, on the morphology, cytology and genetics of the dicotyledonous forms. As such it will undoubtedly fit very well into courses patterned on the British system. In the States it will be useful for reference, possibly as a text for special courses.

AN INTRODUCTION TO GENETICS, A. H. STURTEVANT AND G. W. BEADLE, *W. B. Saunders Co., Philadelphia, 1939. $3.25.*

Here is a new and distinctive elementary text in genetics. Perhaps no field in college science-teaching has had less offered it in the shape of beginning texts than heredity. That these two western scientists have responded to the need is a matter for which we should be thankful. Another fact for which gratitude is due is the new approach the authors have taken to their subject. They have discarded the more or less traditional historical approach and have returned to the old logical teaching method of going from the known to the unknown, from the simple to the more complex, from the basically essential to the more or less explanatory accidental. This is as it should be, and bespeaks for this volume a ready welcome wherever genetics is taught.

AN INTRODUCTION TO HUMAN ANATOMY, CLYDE MARSHALL, *W. B. Saunders Co., Philadelphia, 1939. $2.50.*

Appearing only four years ago in its first edition, this anatomical text met with a sufficiently encouraging reception to warrant its being revised and republished at the prsent time. The assistant professor of anatomy in the Yale University School of Medicine, Dr. Marshall has given the teaching profession, and the students in elementary anatomy, the benefit of much practical experience in the preparation of this work. His book is generously illustrated, and the text is so written that reference to bibliography or glossary is unnecessary. Terms are defined as they occur. The result is a remarkably simplified handling of a difficult subject.

AN INTRODUCTION TO MODERN GENETICS, C. H. WADDINGTON, *Macmillan Co., New York, 1939. $4.00.*

This, most recent product of the results of British cytological and genetic research, represents a real contribution to our literature in the field of heredity. The book is divided into five main parts,—formal genetics, genetics and development, genetics and evolution, genetics and human affairs, the nature of the gene. While Dr. Waddington is primarily an experimental embryologist, he has brought to this text the detached point of view of the biologist who sees what is going on in other fields and desires to correlate them into a unified and understandable whole. The book deserves thoughtful attention.

JOHN HOWARD, LEONA BAUMGARTNER, *The Johns Hopkins Press, Baltimore, 1939. $1.00.*

This is a bibliography and a short biography of one of the greatest English prison and hospital reformers. It is published in uniform style with the well-known reprints of famous scientific documents which the Johns Hopkins Press has been reviving.

LABORATORY DIRECTIONS IN GENERAL ZOOLOGY, W. C. CURTIS AND M. J. GUTHRIE, *John Wiley & Sons, New York, 1939. $1.50.*

This is the third edition of a laboratory guide to accompany the textbook by the same authors. It is bound in spiral form, but is well and clearly printed.

A LABORATORY GUIDE IN ENTOMOLOGY, ROBERT MATHESON, *Comstock Pub. Co., Ithaca, 1939. $2.00.*

Instructors in courses of introductory anatomy will be interested in this loose-leaf laboratory guide if they are looking for a manual which will save the student a large amount of time which would otherwise be spent in the tedious filling in of minor details. For the instructor who believes in his students drawing out all details of the forms studied this manual will be of little assistance.

LABORATORY INSTRUCTIONS IN GENERAL BIOLOGY, JOHN B. PARKER AND JOHN J. CLARKE, *The C. V. Mosby Co., St. Louis, 1939.*

This collection of laboratory exercises is divided into two parts, the first devoted to animals, the second to plants. The whole series is purely morphological, there are no physiological exercises or demonstrations. For a freshman course this is highly questionable, particularly where biology is taught to large numbers of students who will receive no other laboratory training in biological science.

LABORATORY STUDIES IN ZOOLOGY, H. D. REED AND B. P. YOUNG, *McGraw-Hill Book, Co., New York, 1939. $1.50.*

Nine years ago the senior author who has since passed away, and Dr. Young, presented the teaching profession with a manual based on the techniques employed in their courses at Cornell. The junior author has considerably revised and improved the original work, adding a number of new forms to be studied, and condensing some of the exercises so that more time can be spent on more profitable material. The revision will keep old friends and make new ones.

LIFE AND ENVIRONMENT, PAUL B. SEARS, *Bureau of Publications, Teachers College, Columbia University, New York. $1.85.*

Dr. Sears has come to be very well known among thinking people, in the country who are not all biologists, for his realistic publications dealing with the interplay and reaction of living things. To a biologist this is, of course, just plain ecology. Hence it was fitting that when the Bureau of Educational Research in Science began its series of basic science manuals Dr. Sears should be asked to initiate the work with this present volume. The book is hardly a research paper. On the other hand, it is by no means as popular in its appeal as some of his more recent work. It will repay careful reading, not necessarily for its retelling of familiar ecological fundamentals, but for its philosophical application of these fundamentals to modern life and civilization.

LIFE AND LETTERS OF DR. WILLIAM BEAUMONT, JESSE S. MYER, *C. V. Mosby Co., St. Louis, 1939.*

The original life of William Beaumont appeared twenty-six years ago. The trend of recent events has refocussed the attention of the scientific world on the classical experiments of the almost forgotten army surgeon who startled both this country and Europe with his detailed account of the processes of gastric digestion. Since the date of the original *life* new literary remains have been found. These have been incorporated into the original work, which deserves to be in every medical and biological library. The scientific world owes a debt of gratitude to this stubborn, high-principled, old warrior who gave the impetus which sped Claude Bernard and many another physiologist on the way to a better empirical knowledge of the internal functioning of the human body.

MAN AGAINST MICROBE, JOSEPH W. BIGGER, *Macmillan Co., New York, 1939. $2.50.*

As not infrequently happens, the journalists and others of the publicizing fraternity are the first to see news values in some scientific discovery, process or problem. To see with them is to act, and they rush into print with more or less accurate stories, later on, when the popular smoke has cleared away, some scientist with a flair for interesting writing summons up his courage and presents the subject as a bona fide scientist sees it. Such a book is this, the production of the professor of bacteriology and preventive medicine at Trinity College, Dublin. It is up-to-date, it is clear, it is understandable, it is popular,—without sacrificing scientific accuracy.

MANUAL OF BIOLOGY, D. MARSLAND AND PAUL BRANDWEIN, *Henry Holt & Co., New York, 1939.*

This manual is published in two folios, spirally bound, in standard note-book size. The first part is devoted to the Protozoa and the Plants; the second treats of the Metazoan Animals. There are approximately twenty-five exercises in each book. They are carefully worked out in accordance with the most modern techniques of laboratory instruction. Anyone who is interested in this new type of laboratory manual should at least secure copies for inspection. It is true that doing these exercises will take up much less laboratory time, and afford more opportunity for other work. On the other hand, much of the tried and true discipline which has trained more than one generation of laboratory technicians is hereby eliminated. The practicality of this new technique is, however, assured by the authors of these works.

MEADOW AND PASTURE INSECTS, HERBERT OSBORN, *The Educators' Press, 50 E. Broad St., Columbus, Ohio, 1939. $3.75.*

One look at the life history of its distinguished author in American Men of Science, a glance at the modest "blurb" on the jacket, a dip into Dr. Howard's enthusiastic "Foreward" and the happy entomologist who possesses this book will dive into it with keen anticipation. Nor will he be disappointed. The author is one of the surviving members of the pioneers of American Entomology, yet this book is as fresh, up-to-date and stimulating as if it came from the hands of some wild-eyed young enthusiast. The treatment is eminently practical, in that the very first considerations are devoted to the ecology of the meadow in its physical, biological and geological factors. Then comes a discussion of the major animal groups encountered in meadow fauna. Last of all, and most extensively, are treated the particular insect groups which affect the meadows and pastures. There is a fine concluding list of reference literature.

MEDICAL CLIMATOLOGY, CLARENCE A. MILLS, *Charles C. Thomas, Springfield, Ill., 1939. $4.50.*

Climatic conditions have been blamed for a lot of things, a lot of times, by a lot of people. Nobody takes such unsubstantialities very seriously. Here, however, comes a professor of experimental medicine from a reputable institution with maps, graphs, charts and tables that are considerably more than eyeopeners. A careful reading of this book will go far towards substantiating a feeling that there is at least a curious parallel between, not only respiratory afflictions and climate, but also metabolic, infectious, mental, dental, as well as rheumatic disturbances and climatic factors. The book opens up new fields to the physician and the physiology student.

MEDICAL ENTOMOLOGY, WILLIAM B. HERMA, *The Macmillan Co., New York, 1939. $5.50.*

This is the third edition of a book by a slightly different title which appeared first in 1915 and again in 1923. Then it was known as "Medical and Veterinary Entomology," now it is "Medical Entomology, with special reference to the health and well-being of man and animals." The book carries one of the largest general discussions of insects as disease carriers yet seen, six chapters being devoted to this phase of the subject. Mosquitoes and houseflies come in for lengthy treatment as well. The author has approached his task realistically, and the book as a result should be of considerable value not only to the teaching profession but to medical men as well. It will be a valuable adjunct to the biology reference library.

THE MIGRATION AND CONSERVATION OF SALMON, *edited by* FOREST R. MOULTON, *The Science Press, Lancaster, Pa., 1939.*

This is an illuminating report of a symposium recently held where a number of fisheries experts, ichthyologists and ecologists discussed the problems connected with the subject.

THE MIGRATION OF AMERICAN BIRDS, Frederick C. Lincoln, *Doubleday, Doran & Co., New York, 1939. $4.00.*

Ecological students interested in birds, and ornithologists in general, will do well to investigate this valuable work. The author is senior biologist, and chief of the section of the distribution and migration of birds in the U. S. Department of Agriculture. In this position he is able to direct as well as pursue important studies on bird migration. This is a popular, but scientific, summary of what has thus far been ascertained on the subject. Not the least of the valuable information is that connected with the interesting results of bird banding experiments carried on by his department. The book is well illustrated with maps and diagrams, as well as by a number of full-color illustrations by Louis Agassiz Fuertes.

NOTES ON THE HUNTING ECONOMY OF THE ABITIBI INDIANS, William H. Jenkins, *Catholic University of America, Washington, D. C., 1939. $0.60.*

The ninth publication in the anthropological series of the university, this thirty-one page monograph confines itself to the hunting techniques of a small tribe in the province of Quebec about which nothing has hitherto been published.

OF ANTS AND MEN, Caryl P. Haskins, *Prentice-Hall, New York, 1939. $2.75.*

The author of this new philosophical work on the ants is the director of the Haskins Laboratories, and a research professor at Union College, and a research associate at Harvard and M. I. T. His book is significant in that it subjects much of the enthusiastic following of formicine organization to a searching study, the results of which should be read to be appreciated. In the present turmoil of human so-called civilization it is interesting to see an author who is willing to compare the economy of ant colonies to totalitarian communism or fascism. Perhaps the admonition of the royal writer "Go to the ant," was more subtle than we have been led to believe. Maybe the arthropod virtues are to be emulated, but the viciousness of their organization to be eschewed as unfit for human society. At any rate, this book is of immediate interest.

OSMOTIC REGULATION IN AQUATIC ANIMALS, August Krogh, *Cambridge at the University Press, The Macmillan Co., New York, 1939. $4.00.*

The professor of zoophysiology at the University of Copenhagen has contributed to our animal physiological literature a monograph of more than ordinary importance. The regulation of their ionic composition has been long recognized and treated by botanists for plant cells. Zoologists have not been quite as interested in this problem. Stimulated by the secretion of chlorides on the gills of eels transferred from salt to fresh water, the Copenhagen group has gone into the problem and now announces a number of interesting results which should be a stimulus to further research along these lines.

OUR NATURAL RESOURCES AND THEIR CONSERVATION, *edited by* A. E. Parkins and J. R. Whitaker, *John Wiley & Sons, New York, 1939. $4.00*

This is the second edition of a comprehensive work which appeared only three years ago. Twenty-three authors contribute their observations to a symposium of papers of profound national interest. Only one of these is entirely new,—"Fisheries of the Future," by H. H. Martin of the University of Washington. The rest of the papers have been reworked, brought up-to-date, and cross-referenced. The result is a much improved and unified whole which should be an invaluable work of reference, as well as a good text for conservation courses.

AN OUTLINE OF GENERAL FORESTRY, Joseph S. Illick, *Barnes & Noble, New York, 1939. Paper $1.00, Cloth $1.50.*

This is the third edition of a justly

prized outline text which first appeared only four years ago. It embodies all the good features of its predecessors, has been brought up-to-date, and contains not only review questions, but also an up-to-the-minute list of selected references for each of the thirty-one chapters in the work. Its moderate cost should commend it to all forestry students and teachers.

OUTLINE OF PHYSIOLOGY, W. R. AMBERSON AND D. C. SMITH, *F. S. Crofts & Co., New York, 1939. $4.00.*

College instructors who are looking for what appears to be one of the most attractive textbooks of human physiology to appear in recent years will make no mistake if they investigate the possibilities of this entirely new publication. It exhibits at one and the same time a freshness of view-point, an enthusiasm for the subject, a wise understanding of the handicaps of physiological students. The book lacks a bibliography, perhaps not so much of a defect as might be imagined for a beginning course. Most American students have just about lost the power of independent reading anyway. Even with this minor defect, it is hard not to be enthusiastic about it.

PALAEOZOIC FISHES, J. A. MOY-THOMAS, *Chemical Publishing Co., New York, 1939. $2.00.*

This little book is, on the whole, a laudable attempt to bring the Paleontology of the Fishes up-to-date. Slightly less than 150 pages in length, by dint of using a fairly small type, it manages to cover a considerable amount of ground. As a reference work in paleontology, or for the field geologist in regions where fish remains are likely to be encountered, it should be a handy little manual.

PATHOGENIC MICROORGANISMS, W. H. PARK AND A. W. WILLIAMS, *Lea & Febiger, Philadelphia, 1939. $8.00.*

Health officers, physicians and students of both bacteriology and pathogenic protozoa have long since discovered the value of this textbook which has been on the market for the forty years which have elapsed since 1899. Since the tenth edition appeared six years ago, the medical world has been deprived of the unselfish services of the senior officer,—not however, before the revision here offered had been completed. As about the most complete reference work in the field this massive 1056-page tome, with the years of service of its predecessors behind it, represents one of the best acquisitions possible for anyone professionally interested.

THE PASSING OF THE ABORIGINES, DAISY BATES, *G. P. Putnam's Sons, New York, 1939. $3.00.*

Here is a breath-taking story of a life of devotion spent by an Englishwoman among the natives of Australia. It is also a story of misguided though well-meant,—missionary effort, and as always, the magnificent bungling of the English colonial government. More than this, it is the tragic story of a decaying and decadent aboriginal civilization, succumbing to the stupidities of the dominant white man. As a pathetic document it has its emotional side. As a resumé of a life's ethnological researches among a fast disappearing people it has its scientific side, particularly interesting to the anthropologist. As a story well-told, it has its absorbingly attractive side for everyone.

PETROGLYPHS OF NORTH CENTRAL NEW MEXICO, E. B. RENAUD, *University of Denver, Denver, Colorado, 1938.*

Dr. E. B. Renaud, director of the archaeological survey of the University of Denver, is a well-known student of southwestern American anthropology. His present paper is the eleventh report in a series no anthropologist can afford to overlook. It deals with the pictographs, and the petroglyphs in the area north of Santa Fe. These have always been a challenging mystery to tourists, but few people realize how very extensive they are. Thirteen large pages of sketches are devoted to those found in the restricted area covered in Dr. Renaud's study. Another interesting feature of this work is the care with which routes to the various sites are recorded. As such it should become almost a guide for those who are interested in studying these remains for themselves.

PLANT BIOLOGY, H. Godwin, *At the University Press, Cambridge, England; The Macmillan Co., New York, 1939. $2.25.*

Originally publishd in 1930, this volume is the third edition. It is a general manual of botany for students who are taking their 1st M. B. examinations in the English system. As such, and as the product of the joint recommendations of the Universities of Oxford, Cambridge and London, this book bears interesting comparison with our own more or less traditional approach to Botany. Perhaps this volume's treatment can best be indicated by the enumerating of the chapter titles: the living plant, crystalloids and colloids, organic substances and their chemical characters, metabolism of the higher plant, and the plant cell, photo-synthesis, yeasts and bacteria, the fungi, the green algae, fucus, funaria and pellia, the fern plant, tissue elements of the higher plants, the root, the stem, the leaf, the flower and the seed. All of which makes us wonder if we cannot learn a lot in logical presentation from our British coworkers in botany.

PLANT PHYSIOLOGY, B. S. Meyer and D. B. Anderson, *D. Van Nostrand Co., New York, 1939. $4.50.*

The by-product of plant physiology courses at Ohio State University and the University of North Carolina, this new text has its own contribution to the teaching of this subject. This seems to the reviewer to be the possibility of giving a fairly complete course on a basic foundation of no more than an elementary course in botany and perhaps an elementary knowledge of chemistry. Neither advanced physics nor that bug-bear of most undergraduates, calculus, seem to be prerequisite for a course so handled. Another small item, but to the unprejudiced reader, almost a stroke of genius, is the use of living material in making all of the illustrations, instead of dehydrated, prepared specimens. There can be no question that the latter do not give truly accurate conceptions of the actual conditions found in the living plant. Why did not someone think of this before?

PLANT VIRUSES, Kenneth M. Smith, *Chemical Publishing Co., New York, 1935. $1.25.*

This is an American reissue of a standard text originally produced in Great Britain by Methuen. It is an attempt to give in the brief compass of less than a hundred vest-pocket-sized pages, some of the more important facts about plant viruses. It will be of more than ordinary interest to botanists and entomologists.

THE POISON TRAIL, William F. Boos, *Hale Cushman & Flint, Boston & New York, 1939. $3.00.*

An expert toxicologist in an autobiographical narrative here tells something of that most fascinating and fearsome subject, poison. There have been many books published in recent years which touch on the dangers of commercial, medical, and other types of poisoning. This is the first more or less popular work, however, to take up the subject extensively. It needs little dipping into this volume to find it difficult to lay it down. The author holds an enviable place in toxicological work, and the weird variety of his experiences puts this production in a class distinctly by itself.

POLYCYCLIC AROMATIC HYDROCARBONS, C. Weizmann and E. Bergman, *Chemical Publishing Co., New York, 1938. $1.25.*

The polycyclic hydrocarbons have two very interesting aspects for the biologist,—their carcinogenicity, and their oestrogenicity. This report of work done in the Daniel Sieff Research Institute is published among the papers of the Academy of Jerusalem, and includes an abstract in Hebrew.

PRINCIPLES OF FOREST ENTOMOLOGY, Samuel A. Graham, *McGraw-Hill Book Co., New York, 1939. $4.00.*

Ten years ago the first edition of this work appeared. It was well received although the interest in forestry then could by no means be compared with the slowly reawakening public conscience on the subject of national resources and their conservation. Now an almost entirely new second edition has come on the market, so much improved that there is no question of its utility, practicality, and opportuneness. Embodying all the worthwhile material of the first edition, it has the added value of up-to-the-minute information on the latest developments regarding termites, bark beetles, insect-caused losses, contemporary workers in forest entomology, and the important indirect effect of forest insects in their influence in the dissemination of other insects and tree disease causing organisms.

PROBLEMS OF AGING, *edited by* E. V. COWDRY, *Williams & Wilkins Co., Baltimore, 1939. $10.00.*

Twenty-six outstanding scientists, most of them American, one British, contribute to this 742-page symposium on the problems of prolonging human life, and lessening those internal disturbances which shorten life. Among these papers are not an inconsiderable number of announcements of new research results, as well as a general summing up of all available knowledge on this important subject. The convergence of so many research workers on a single topic has already suggested some possible avenues approach towards the solution of age-problems. Others will undoubtedly come to the front as this volume is more thoroughly studied.

PROTEIN METABOLISM IN THE PLANT, ALBERT C. CHIBNALL, *Yale University Press, New Haven, 1939. $4.00.*

The 1938 Silliman Lectures were presented at Yale by the professor of biochemistry in the Imperial College of Science and Technology of the University of London. The lectures are mainly concerned with protein metabolism in seedlings, and in plant leaves. As a reference work in the plant physiological library it becomes a necessity, not only by reason of its author's position, but also because of its pertinent survey of practically all the recent work on the subject.

PROTOZOOLOGY, RICHARD R. KUDO, *Charles C. Thomas, Springfield, Ill., 1939. $6.50.*

The associate professor of zoology at the University of Illinois presents the world with an enlarged and completely rewritten edition of his 1931 "Handbook of Protozoology." The first six chapters deal with the general field of the protozoa, their ecology, structure, physiology, reproduction and heredity. The remaining thirty-seven constitute a rather complete taxonomy of the protozoa. Since each of the 291 plates which illustrate the work consists of from four to twenty separate sketches, it is not hard to see that this is a really valuable reference work for all courses in zoology where even the slightest attention is paid to the protozoa.

QUANTITATIVE ZOOLOGY, G. G. SIMPSON AND A. ROE, *McGraw-Hill Book Co., New York, 1939. $4.00.*

With the publication of this work zoology has gone the way of all the other sciences and become mathematically exact. It might have been expected that sooner or later methods would be found to express zoological deductions in numerical concepts, mathematical symbols and formulae. Perhaps this is just as well. It is nearly time that some of the vague generalities and generalizations of our science be left on a siding as a little too antiquated for modern science. A little pinning down to actual facts, mathematically tabulated and formulated might be the discipline we all need. In a day of conflicting ideologies the superficial propagandist finds his way into most unexpected places. But, the superficial propagandist confronted by a logarithm is about the saddest thing we know.

RACE RELATIONS AND THE RACE PROBLEM, EDGAR T. THOMPSON, *Duke University Press, 1939. $3.50.*

This is a distinct contribution to our ethno-sociological literature. Issued as one of the Duke University Centennial publications, it represents the matured judgments of leaders in biology, economics, politics and cultural relations. Anyone interested in a joint attack on race problems as they exist throughout the United States will want to read, and possess, this book.

THE RACES OF EUROPE, Carleton S. Coon, *Macmillan Co., New York, 1939. $7.00.*

Physical anthropology is so broad a subject, and to a certain extent so subjective, that the author of this text has wisely restricted it to the racial history of the white division of *Homo sapiens* from the pleistocene age to the present. "If there is one consistent theme in this book, it is that physical anthropology cannot be divorced from cultural and historical associations, and that there is no such thing as "pure" biology, at least in reference to human beings." On this basis the racial identification and classification of living white peoples has been emphasized. One of the significant things about this work is the author's calm dismissal of most of the "Nordic" propaganda, and his complete omission of the word "Aryan" from the subject index.

RECENT ADVANCES IN SURFACE CHEMISTRY AND CHEMICAL PHYSICS, *edited by* F. R. Moulton, *The Science Press, Lancaster, Pa., 1939.*

This symposium of papers is divided into two groups, the first dealing with the applications of surface chemistry in biology, the second with recent advances in chemical physics. The former series is largely ground-breaking experiment, largely relating to the properties of unilayer and multilayer films and the explanation they may have to offer for the problems of material exchange through living cell surfaces. The latter group of papers is a comprehensive treatment of the separation of the isotopes of the elements, chemical thermodynamics, band spectroscopy of polyatomic molecules, applications of the Raman effect, and considerations on the rates of chemical reactions.

THE SOCIAL FUNCTION OF SCIENCE, J. D. Bernal, *Macmillan Co., New York, 1939. $3.50.*

One of the leaders in the movement which is known in the country as the American Association of Scientific Workers, Dr. Bernal has contributed a powerful piece of propaganda for the cause in this particular book. The volume is divided roughly into two parts, "What Science Does," and "What Science Could Do." In the light of recent happenings one wonders how Professor Bernal would recast his total disapproval of Nazi scientific attitudes, and his deferential treatment of the aims and methods of the U. S. S. R. to which he gives so much space, and even prints an official letter from a Russian official in the Appendix. These things are sometimes curious to the bystander.

STANDARD CHEMICAL AND TECHNICAL DICTIONARY, H. Bennett, *Chemical Publishing Co., New York, 1939. $10.00.*

Every chemist and a lot of biologists dealing with chemical reactions has frequently been confronted by new and not altogether intelligible terms which are not to be found in the ordinary dictionaries. Many of them are also absent from otherwise helpful and excellent medical dictionaries even when such are fortunately available. To meet the needs of all this group a new chemical and technical dictionary has been compiled. It will fill a long-felt need, and should find a warm reception.

STATISTICAL TECHNIQUE IN AGRICULTURAL RESEARCH, D. D. Patterson, *McGraw-Hill Book Co., New York, 1939. $3.00.*

Agricultural research has been increasing with each turn of the tide of American fortune. As a result a more definite technique for recording, classifying and interpreting the results has become imperative. This technique is suggested by the present book. It is, as it claims, "clear, simple and logical." In addition to basic formulae, there are chapters devoted to variation and covariance, contingency tables, correlation and regression, and many other adaptations to farm problems.

A TEXTBOOK OF ANATOMY AND PHYSIOLOGY, Jesse Feiring Williams, *W .B. Saunders Co., Philadelphia, 1939. $2.75.*

This is the sixth edition of a textbook that has consistently held a position in the forefront for courses in general anatomy, human physiology, hygiene, and all forms of physical education. Strangers to it should feel confident of its practicability, former users will be satisfied to continue using it.

TREES OF THE SOUTH. CHARLOTTE H. GREEN, *University of North Carolina Press, Chapel Hill, 1939. $2.50.*

Southerners who are interested in anything which will build up a love for trees,—northerners who want to know something about the different, and often lovelier, trees of our southern states, both will profit by possessing this book. There is one feature about the book which commends it to the traveller, a profusion of photographic illustrations. These are intelligently arranged. One side of each sheet of plates contains a full-page photograph of a typical tree, on the reverse are from two to five plates, also photographic, illustrating, leaf, stem, flower and fruit habits.

TUBERALES OF NORTH AMERICA, HELEN M. GILKEY, *Oregon State College, Corvallis, 1939. $0.50.*

This is the first in the series of studies in botany published under the general heading of "Oregon State Monographs." Its author is associate professor of botany at Oregon State College, and curator of the herbarium. The publication deals with the comparatively little known group of American truffles, the Tuberales. They have been collected in nineteen states, the District of Columbia, and in four Canadian provinces. This is the first comprehensive work concerning the North American continent, north of the Rio Grande, that has appeared. Mycologists will welcome this addition to our literature.

TWILIGHT OF MAN, EARNEST A. HOOTEN, *G. P. Putnam's Sons, New York, 1939. $3.00.*

This is another of those smartly sophisticated, and trenchantly apposite books with an anthropological flavor by Harvard's professor of anthropology. Dr. Hooten is by way of becoming some sort of a sociological George Bernard Shaw, and an anthropological Dean Inge. After an elaborate disquisition on the ape in man in his "Apes, Men and Morons," he now gives us the other side of the story, the man in the ape,—with an occasional digression into his previous theme, as if there were a lot of good material he could not crowd into the last one. Dr. Hooten would be the last to claim any aura of infallibility so he will forgive us if we read a good deal of what he has written with our tongues in our cheeks. However, his apt title rather grips us. Is it a prophecy or a threat? Certainly there seem to be many in the world's high seats who do not mind making apes out of themselves.

WHITE SETTLERS IN THE TROPICS, A. GRENFELL PRICE, *American Geographical Society, New York, 1939. $4.00.*

Now that a partisan spirit of intolerance is drawing invidious lines between peoples, races, and religions, the relocation of exiles is bound to become a problem of more than major importance. This monograph on the results of settling white peoples in tropical lands is a real contribution to our literature. The author holds out some hope for the procedure, providing the nations make up their minds to learn from their past mistakes. The author feels that the scientific world is at last glimpsing the vastness and complexity of the problem. "In the hands of scientific workers lies the solution."

THE WISDOM OF THE BODY, WALTER B. CANNON, *W. W. Norton Co., New York, 1939. $3.50.*

Seven years ago the original of this present volume appeared. It was a logical successor to "The Mechanical Factors of Digestion," "Bodily Changes in Pain, Hunger, Fear and Rage," and "Traumatic Shock." Its main thesis is the extraordinary capacity of the human body to adjust itself, known as homeostasis. The position of the author on the staff of the Harvard Medical School is ample guarantee of the scientific importance of this contribution to our physiological literature.

THE WORLD OF INSECTS, CARL D. DUNCAN AND GAYLE PICKWELL, *McGraw-Hill Book Co., New York, 1939. $3.50.*

Here is that rare kind of a zoological book which one could offer as a gift to any reasonably well-educated adult with an assurance that it would be found interesting, thoroughly scientific, practical and even useful. The book is not as extensive as the average entomology. All the scientific terms are defined as they occur. There is a general survey of the entomological world, chapters on the life processes of insects, mimicry, and the like. There is also an interesting and, even to the dyed-in-the-wool scientist, provocative section on insect collecting, rearing at home, and preservation. All in all, it's a bit different from anything we have thus far seen. As a semi-popular piece of scientific writing it should find a more than welcome place in public and school libraries, on the Boy Scouts book-shelf.

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